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FRANK HERBERT PALMER, EDITOR

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EDUCATION

Devoted to the Science, Art, Philosophy and Literature of Education

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The Future of the Public Schools

PROFESSOR J. B. JOHNSTON, UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN.

WHEN public schools were first established in this country, the youth who were to be prepared for the pulpit and the bar were living on farms or in villages where almost every boy and girl was engaged in home industries. To these youths the opportunity for book-learning opened the way to something beyond the vocations of their parents. A great change has come about in the social and economic conditions without a corresponding change in the schools. Manufacturing has been transferred from the home and small local shop to the factory. To bring the raw materials to the factory and the finished products to the consumer, a large part of our population is now engaged in transportation and in buying and selling. Cities and towns have grown up about factories and commercial centers, and these include a large and ever-increasing portion of our population. In these new conditions the middleman often does not even see the goods which he buys and sells; the truckman, the freight handler, the railway employee never handle goods but only containers; the families of the lawyer, banker, real estate dealer, insurance agent, minister, physician, dentist, teacher, and so on, have only an indirect relation to economic processes. In all these cases there is no home industry, and the boy or girl may never come into contact with any productive work. Only in agriculture—and the sweatshops—

is the family directly concerned with economic processes; and even on the farm, home industries have almost ceased to exist. The tilling of the soil is done by large machines and is rapidly becoming specialized. The boy and girl of the farm are relieved of continuous co-operative employment in the manifold duties which used to make up farm work. Now they go to school and dream of opportunities to move to the city. School-room instruction is no longer an accessory to the practical training of the home, but has come almost entirely to take the place of such practical education.

What is the character of the instruction and what the equipment of the schools for this purpose? The subjects which are still regarded as the backbone of the public school work, namely,—reading, writing and arithmetic,—are the common tools by which knowledge is acquired and transmitted. They are not themselves objects of knowledge. For the boy to spend most of his time during several years studying reading, writing and arithmetic is much the same as if a carpenter's apprentice were put into a room where there were hammers, saws and planes which he might look at and talk about, but where there were no boards to saw and no nails to drive. This is the fundamental fault in the public school. It separates its pupils from real life and gives them class-room instruction *about* the tools of knowledge.

It is important that we understand just what has taken place. Under the old economic system the child early took a share in the industries of the home and a little later the boy was apprenticed to a craftsman. The child was from the first in close contact with the economic processes by which the family gained its living, and both boy and girl grew up in the work which was to occupy them for life. Such theoretical instruction might be added as would increase their efficiency in their trades. When the factory system grew up, children for a time learned their trades in the factories. Now child labor has been forbidden and school attendance has been made compulsory. Thus the old apprenticeship has been replaced by schooling. From this point of view the object of the school is to enable a man to become a master of industry without becoming, by the regular route of apprenticeship, a master workman.

How do the schools attempt to do this? By teaching the forms of

language and arithmetic without giving opportunity for their use. By teaching geography, history, chemistry and numerous other subjects in the school-room from books or at most with the help of formal demonstrations or experiments which have no obvious relation to practical affairs and disclose little connection with the processes of actual life. This is most clearly illustrated in the teaching of what is called arithmetic. An example from one of the best present-day text-books reads as follows: "My agent has sold goods to the amount of $5840. His charges are: commission, 2½%; cartage and storage, $10.40; and 1% for guaranteeing sales. How much is due me?" Obviously the purpose of this is not to teach arithmetic, because the arithmetical processes involved are familiar to the pupil several years earlier. The subject of this example and of a large part of this book is business forms and methods. Under the name of arithmetic the schools attempt to teach business forms in a school where the pupils have no contact whatever with business, while the teacher's experience extends no farther than paying her board bill. The teacher knows nothing at first hand about buying and selling on commission, about insurance or banking. She only tells her pupils, as she was once told, that to work the problem in a certain way will bring the right answer. The pupil learns nothing of the business but only repeats mechanically the simple processes learned years before. The problem remains to the pupil the most deadly form of abstraction,—namely, an abstraction couched in concrete terms. Similar criticism could be made of the teaching of sciences, history, and geography. The schools thus teach certain things in the school-room wholly removed from the business of life, things which may afterward be useful if the pupil remembers them and recognizes their application. This is our substitute for the direct method of the apprenticeship in which the pupil lived in his business.

The popular estimates of the value of this method of education may be judged from the great number of children who leave school at the earliest opportunity, and from the widespread dissatisfaction with the schools. The schools are criticized for wasting the pupil's time, for teaching "fads" and useless subjects, for failing to give the children practical training for economic work, and for being too expensive. My own criticism of

the schools would be that not enough money is put into them, that they are poor in equipment, that their teachers are too few and underpaid, and that they have taken the child away from his natural interests, have shut him up for long hours with wearisome tasks, and have given him only swings and teeter-boards for re-creation. Consider the playgrounds provided for the children when released from their studies; small, barren, dirty, cheerless, and equipped with trumpery to fritter away the pupil's time and appreciation. How many children are kept from playing truant by the chance to slide down a tin-lined trough at recess time? How many children would run away from gardens and shops and the chance to do things worth while?

The schools suffer also from the academic struggle between certain subjects for the dominant place as a means of mental discipline. This is the natural result of the cloistered character of the schools. No subject in itself has a claim to superiority. It is only in working out our individual interests and needs; it is only through self-expression, through the creation of something that satisfies our imaginations,—it is only thus that we build up our minds and characters, and acquire capacity and efficiency. It is not what the pupil receives, but what he uses, what he gives out, what he puts in action or embodies in form, that enters into his character and makes for his efficiency and power of appreciation.

It must not be thought that the schools have been standing still all these decades. The teaching profession has made great efforts to improve the school system. The demand for informational or "useful" teaching has led to the introduction and development of many new subjects,—geography, history, sciences. The advantages of the objective method have called forth laboratories for physics, chemistry and biology, sand-piles and modelling clay for geography, building blocks and card-forms for geometry, et cetera. The importance of interest in educational theory has swept over the country like a prairie fire and the principle has been incorporated in the text books of pedagogy. Nature study and the culture-epoch theory have been exploited. Teachers have their local and national societies for the promotion of education. Teachers are, as a rule, persons who are taken while young, with only such training as the schools give, and

set to teaching in the schools. In their institutes and societies they study methods, but, having little acquaintance with real life, they do not know whether the things they do are useful to society.

Meantime, two vital forces have spent their influence on the schools and we are in the midst of a third reform wave. The first of these is the kindergarten, with its ideals of employment and of first-hand contact with things. Its influence has led to great improvements in the management of young children. The second is represented by the schools of manual training and domestic arts. These schools proposed to offer practical preparation to those who wished to enter manual trades or domestic management. The manual training school, however, undertakes no economic function, it manufactures no goods, it neither buys raw materials nor sells any product in the actual market. It has therefore never wholly emancipated itself from the fundamental weakness of the schools,—the dealing with formal processes instead of doing real work. The manual training school as organized at present can not take the place of the master craftsman.

At the present time the same progressive forces which have introduced the kindergarten, the study of sciences, and manual training, are urging upon our attention the garden movement, the playground movement, the vacation schools, and the movement for agricultural and other vocational schools. All these are good because they deal to some extent with actual life and bring the pupil into working contact with the world. Indeed, the vocational schools give the best promise of a real reform of the educational system. These movements all make the school curriculum more broad. Crowding the curriculum however, weakens the study of the formal branches. Are all these to be regarded merely as additional subjects-to-be-taught? Is the tent merely to be crowded by the entrance of the camel's head, or must we give up the whole tent to the camel? Does the introduction of new subjects represent a principle in education, the full recognition of which will work a thorough reformation of our school system?

The end of the schools is to fit men and women into the society for which the schools exist. The purpose of education is to bring the child into connection with life, not to enable him to avoid its realities or to escape its severities. Shall the pupil learn

from books or in play shops or experimental laboratories, or shall he learn by doing real work of economic value carried on by methods known to be successful in the business, social and literary world?

Very obviously the objects which the child should know are his surroundings, the conditions of his life, nature and man. The earth, its conformation, and climate; the relations and interactions of material things; living things and the conditions of their life on the earth; human life, physical, economic and social, and the products of the human imagination,—these are real objects of knowledge and these have intense and undying interest. The child is actively interested in all the objects about him, in living things, in fruits and flowers,—and we put him into a school-room and teach him to read. He is attracted by moving trucks, by mills grinding grain or weaving cloth, by printing-presses or the telegraph, by thundering trains or still-moving steamships,—and we teach him percentage, interest, and commission out of a book! Was it more important for me to learn to extract the square and cube roots for the sake of the mental discipline, than for me to learn the soil of my father's farm, to learn how plants took their nourishment from the soil, to learn how crops were marketed and raw materials manufactured, to learn how my own body was constructed and how it did its work? Could I not have learned arithmetic in learning these useful things? And would I have lost as regards mental discipline,—or gained? I should have lost the incentive to bad mental habits and should have gained attention, concentration and the power to follow a dominating purpose to a successful end. Indeed, the boy who grows up on the farm gains incomparably more in reasoning power and in responsibility (i. e. moral character) from his duties at home than from his studies at school.

The result of our method of teaching is to destroy interest and leave our youth painfully ignorant of human life and of the world in which we live. How many boys or girls when they leave their schools have a satisfactory, usable knowledge of their own bodies or the conditions of healthy living? How many are acquainted with the animals and plants, the soils and the climatic conditions governing the production of food? *On these things their lives depend.* How many have an appreciation of any piece

of literature, music or work of art based upon the relation of that work to human life and experience?

Mathematics and the native language are tools which should become part of a boy's habits, like using knife and fork or wearing a coat. There is little place for formal discipline in early years if the child has active employment in which he can use number and language. When these are used as tools only, the child's study is objective, his methods are active, expressive. Interest is aroused by dealing with real things, imagination is stimulated by accomplishment, and the processes are remembered because they become a part of the child's organic activity. The use of the tools is learned as an incident in real life and the child is the clear gainer by whatever he learns of nature and man and productive effort.

Some children finish the work of the eight grades in three or four years without unusual ability or injurious application. The great waste of time in our schools is due to the substitution of formal disciplines for natural activities (i. e. the cloistered separation of the school from ordinary life) and to neglect of differences in capacity and tendencies among children of the same age. Pupils repeat the same subjects year after year by means of graded text-books and spiral methods. The spiral method is only a dusty staircase leading into an empty and dreary attic. The apparent dullness of pupils is due to the fact that nothing in their experience enables them to see the worth of the abstract studies set for them. Educational institutions must set up as their goal the development of the child instead of the development and defense of formal disciplines.

Let me outline the chief features of public education in a far country where the people have adapted their schools to social conditions not very different from our own. I cannot of course enter into details growing out of geographic or economic limitations.

Wherever possible during the first period of the child's education farming or gardening plays a prominent part, and no school is wholly without work of this kind. The weaving of baskets, mats, curtains and simple furniture from wood, grass or reeds gives suitable employment for the winter and inclement weather. The development of the kinaesthetic sense, of the power of visu-

alization, of the appreciation of form and proportion is secured by this work and through modelling and clay-working, together with the study of works of art, geographic formations, and so on. This work is closely related to the excursions in the country and the organized games in the playground, and all three have an especial value in indicating to the teachers the capacities of the child and his possible future interests. Through these earlier years there is scarcely a perceptible line of division between serious work and play. The work and the organized games are all interesting and are carefully designed to be developmental, and neither is prolonged until it is irksome.

Along with the work goes the use of language and arithmetic as they are needed. The words first used are the names of the plants grown and of the tools and processes used in the gardening and other work and games. The language of the home and the expression of the relations and duties of the home are also part of the child's early language work. Language exercise is at first only oral and inherent in the work being done. Writing is taken up later, after the hands have had some other training and when there is occasion for written records or reports of work done. Abundant occasions arise in which the use of simple arithmetical processes is necessary and these become instinctive and habitual. The proper use of language and arithmetic during these years is just as much a matter of forming correct habits as is the wearing of clothing suitable to the weather.

The transition to the second period comes, not at any particular age, but when the child shows himself ready to take up the more steady and serious work of the second period. A certain degree of dexterity and control of the muscles, a certain amount of perseverance and clearness of purpose, accompanied by sufficient indication of bent or talent to justify the child's entering a specific occupation, are prerequisite to entrance upon the second period.

At this time are undertaken two or three occupations which correspond to economic trades or arts and which seem to lie within the given child's capacities. After some trial of each of these, one is chosen as the chief work for this period. Great care is taken that the child find the occupation in which he can do his best work and in which he will have a feeling of satis-

faction and pleasure. To illustrate the trades and arts commonly open to the pupils under the guidance of the schools, the following are mentioned: various agricultural pursuits (farming in the country, market gardening near cities, city gardening, flower gardening, greenhouse vegetable and flower raising, fruit raising, animal breeding, bee culture); wood-working, carpentry, cabinet-making; metal working; clay-working for the building trades; clay-working for pottery or home ornamentation; modelling and sculpture; painting; textile-making (spinning, weaving, etc.); dyeing, stencilling and textile ornamentation; preservation and preparation of food materials, with their many branches; the arts of home-making.

Each school carries on such of these arts and trades as the conditions with reference to geography, climate, raw materials, character of population, and markets render advisable. The products of the fields and shops are placed on sale locally or shipped to distant markets. The stores and shipping are all conducted by pupils under the direction of the school authorities. Accounts are kept of all elements of cost and the net returns of the economic work of the schools are accurately determined. All returns from the sale of products go into the school funds and materially aid in paying the expenses of instruction. All the business dealings and accounting connected with this work are conducted by the pupils and form the substance of their training in arithmetic and in business procedure. Since the work is theirs and the products are used to pay for their own education, they are not learning lessons in arithmetic but are conducting their own business.

Similarly all the written directions, all the records of farm work, of experiments, of processes and specifications in the shops or kitchens, are expressed in forms adapted to the subject and purpose in hand and constitute part of the pupil's exercise in his native language. Many opportunities for training in both mathematics and language occur in connection with the other studies in this second period.

These studies cover the most general fields of knowledge and are planned with reference to their usefulness or availability to the student in his life.

Physical and economic geography are studied first locally and

later more widely. The significance of geography for the industries of the school gives the first point of contact and arouses interest. Political geography is studied later in connection with history.

Beginning with the simpler physical and chemical laws connected with the school industries, the pupil acquires a large amount of general scientific information important for every-day life.

Starting from his agricultural work and local field excursions, the pupil becomes familiar with the animals and plants of his locality and gains some real understanding of the conditions of their lives, their economic importance and their aesthetic values.

Beginning with the simple accepted maxims connected with muscular exercise, hunger, thirst, breathing, bathing and care of the body, the pupil learns the relation of these to his employments in school and goes on to acquire such a knowledge of the human body in relation to its surroundings, of personal hygiene and public sanitation as to materially reduce disease and greatly increase the efficiency and the capacity for happiness in all the people.

The employments of the early school years suggest the early stages of human culture which are told in story and song. In the second period the pupil follows the development of industries and culture, becomes acquainted with the great ancient civilizations and sees the relation of their growth, development and decay to the facts of physical geography, commerce and human intelligence. Upon the broad general knowledge of ancient civilizations he bases a study of the chief nations, their political geography and the growth of the larger ideas and social customs that have survived to the present day. In thus following the story of peoples, manners and customs, work and culture, he comes to understand the place of his own people in the great pageant of human history.

Finally, the pupil becomes familiar with the best literature and art of his nation and has the opportunity to learn the language of at least one other modern nation.

While the work of each boy or girl is largely centered about an industrial art or trade, the pupil by no means spends all of his time in manual work. His instruction in modern language,

literature and art, in physics, chemistry, biology and hygiene, in history and social organization are at once more broad and more practical than is the instruction in similar subjects in our country. Although advantage is taken of every opportunity for learning through practical work—as in our "direct method"—abundant opportunity is offered in these studies for mental effort consciously directed by the pupil for definite indirect and distant purposes. Time and effort are saved by the practical methods, but moral and intellectual development are also secured through the scientific and cultural studies.

The third period is that of the college or professional school. In preparation for this the pupil has acquired by the age of sixteen to eighteen years all the academic subjects which we expect for entrance to college, and in addition has had all the physical, mental and moral training of an economic trade and the added significance which this gives to the academic studies. For most of the higher professions his industrial training is directly helpful, while it greatly enhances his sympathy, his ideals and his social vision.

I have already suggested the grounds for thinking that such things as these could be accomplished in our own schools. The methods proposed would make good use of the large amount of time and effort that is now wasted in the grades. The learning of tools requires little time when the tools are used in practical work. The interest in real objects of knowledge would replace the present characteristic languor or repugnance of school children with enthusiasm and quick apperception. It is not necessary that our children should have made further progress in their academic studies at a given age, but they should have a very much wider and more practical knowledge of the world and of human life.

The economic and social aspects of such schools are very important. As already indicated, the schools would buy and sell in the actual market, and the productive capacity of childen would contribute to their own development. Under capable management and with prime regard for the welfare of the children themselves, the products of the schools would pay a considerable part of their cost. Adult workers now support by their labor (1) children of school age, (2) large numbers of unproductive or

partially self-supporting youths, (3) many criminal youths and adults, and (4) defectives. All these except the feeble-minded would become self-supporting if properly trained during childhood, and the addition of their product would enormously increase the social wealth.

Not only would the social wealth be directly increased by greater productivity, but the wastes of crimes and the punishment of criminals would be largely eliminated. A great part of the cost of our jails, penitentiaries and police should be added to the school fund. I mean that criminality is largely chargeable to our present inadequate and unintelligent method of training the young and that good education would pay because it would eliminate much of the costs of criminality.

In such schools there would be ample opportunity for each child, under wise guidance, to find what calling suits his tastes and talents, and society would be saved the incalculable wastes due to misdirected efforts and the low productiveness of men in lines of work for which they are not fitted. The weakness of the apprenticeship system lies in its inflexibility. Too often the boy was bound to the trade of his father or uncle regardless of his own capacity or tastes. The weakness of the present system is that the child has no guidance. The school does not pretend to guide him and he has no practical contact with life in the home. The advantage of the proposed system is that the pupil would have ample opportunity to find the trade or vocation best suited to him while still under the tutelage of the state and before the need of winning his way ties him up to his mis-calling for life. In the passing of the apprenticeship system we lost an excellent educational method and gained a factory system whose division of labor rendered education unnecessary for economic efficiency. With our easy economic conditions and vast natural resources to exploit, men with self-confidence and self-assertion and a little schooling led in manufacturing, transportation and other enterprises; while the uneducated filled the ranks of common laborers and factory workers. Now that our natural resources are largely run through with and economic competition is becoming more intense both locally and internationally, we see that the factory system requires intelligent workmen and that leaders of industry must be trained for their undertakings. And not

only training but native ability must be taken into account. The man must find that work for which his peculiar talents best fit him. Otherwise his efficiency is greatly reduced and his satisfaction in life lessened or destroyed. This is perhaps the greatest source of economic, moral and aesthetic loss in present society. The freedom to choose a vocation coupled with the lack of any adequate guidance are most wasteful of human talent, and productive of individual dissatisfaction and disappointment. We must regain the educational method of the apprenticeship and the skill of the craftsman. While retaining the freedom of choice of a vocation we must make that choice intelligent and so conserve and develop human powers. We must meet the harder conditions if life of future years with a better training and better organization in social and economic life, to the end that moral and aesthetic values may not be lost in the struggle for existence.

It remains to express more explicitly what has already been suggested, that the desired end is to be gained not by any revolution or period of anarchy in the schools but by the completion of the processes which are already at work. Half consciously the revolution has been carried on for several decades. The inevitable result of the introduction of the objective method, of scientific studies, of practical employment, is that these real things will replace merely formal and abstract studies. The pupil will learn arithmetic as a part of the processes of agriculture, handiwork and business dealings. He will learn to use good English because he is constantly under the charge of cultured persons who use good English. Every bit of writing done in connection with his practical work will serve as an exercise in English. He will study also the best writings as the products of man's work, and therefore of objective value. The child's school years will be spent in the present, as a factor in the social fabric of today. He will cease to spend the winter shut up in unhealthful school rooms and to spend the summer running riot. The summer with its sunshine and abounding life will be the time for agricultural pursuits, for excursions and nature study. The winter will be the time for manual and domestic employments. Because of the winter inroads upon the vitality, the hours of work will be shorter in winter than in summer and more attention will be given to

recreation. School life will cease to be a thing of horrid memory, a time of tiring tasks and of stupid sitting in rows of desks. The school occupations will include the most interesting and enjoyable things. The child's life will be chiefly a life of activity in making things, in cultivating plants, in seeking out the habits, food and growth of animals, in studying geography in the field, industrial processes in the factory, literature, music and art in the libraries and galleries which will become largely adjuncts of the schools. Once more children will be given a place in the family and society. They will no longer be shut up in school to pore over books every day. They will take part in the pursuits of the people around them and will grow up into the life of the community. They will do these things not just in the old way by which the boy succeeded to his father's trade or was apprenticed to the most available craftsman; but, with all the economic and cultural resources of society before them and under sympathetic guidance, they will try their hands at various occupations and will find their places in that work which most befits and attracts them.

Guardianship of the Working Child

By M. Edith Campbell of the Schmidlapp Bureau, Cincinnati.

IN assailing vocational theories of education, critics seldom, if ever, literally face the task of providing for each boy and girl in that large group of children, which should be the chief concern of the Public School. Both the critic and the School are inclined to evade this unwelcome responsibility, because they find it easier to continue the stereotyped courses in education than to face the puzling facts of this wage-earning group which averages 50% of all the school children, and which leaves the superficial guardianship of the school almost totally unequipped for the years to come.

One often wishes that authors of glib attacks on attempts toward solving these vocational problems, might be compelled to settle the question which each child of this group asks, as they go trooping past in a steady unending procession—some mentally handicapped, some physically disabled, many financially stranded, not a few educationally thwarted, and all of them demanding of their rightful guardian, protection against the misfortunes of the untrained. In such an event, the hasty critic might view with more consideration the obvious necessity some of us are feeling, to lay at least the foundation for a system of advice and supervision for the child who leaves school at an early age.

The obligation of the school toward this working child seems as apparent as that of the state and the community, and no logical reason can be advanced why the school should educate 10% of the children until the normal age for completing High school, and eighteen years, and abandon 50% to their own resources, at fourteen years of age, simply because they have passed outside the narrow confines of school walls. Concerning this obligation, Miss Breckinridge several years ago, made the statement:

"If work is recognized by the law as the alternative to school, it should be on the ground that the work will give the child the

needed training or preparation for that later period in the child's life in which the law wholly ceases to exercise control." The school, as the agent of the law, accepts the responsibility of sanctioning this alternative by officially granting the child's withdrawal. Therefore the school should also, as the agent of the law, become the guardian of the child during this period of preparation. This guardianship may be exercised by the school, in general terms, by a keen realization of the necessity for greater elasticity in the elementary grades which would meet this child's needs with the vocational motive; by a more intimate knowledge of the child's home and physical environment; and by constantly keeping in mind, as Professor Mead says, the "human fortunes" of the child before and after leaving the school room. As he so aptly shows, the school has wrapt itself in a snug satisfaction with its own system, losing the vital and enriching experience, as well as the absorbing interest, of following these "human fortunes"—which experience and interest alone insures its growth and progress.

The guardianship may be assumed in many specific ways. The one which the school has failed most signally to recognize as a potent opportunity is in the issuance of work certificates, and the greater part of what I have to say is based on the experiment which we have tried in this connection in Cincinnati under the leadership of Mrs. Helen T. Woolley. Six years ago Mr. Clopper of the Child Labor Committee, and I as the Director of the Schmidlapp Fund, secured permission of the Board of Education to issue age and school certificates—a brief statement of which was written for the Survey a few years ago. We had no idea or plan for developing the use of this function beyond that of research for our particular purpose. Hence its growth into a Vocation or Guidance or Service Bureau, as it was variously christened by the community, surprised even those of us who felt the power of this factor in school organization. Mrs. Woolley has recently stated the opportunities for guardianship through this function in a brief paper in School and Society, and her suggestion to the Childrens Bureau that its development be further investigated has borne fruit in the volume on Connecticut and the one now in the writing on Ohio. In her words, we believe that:

"Working permits may have a very direct bearing on school problems or none at all, depending on how they are issued and what use is made of the information obtainable through issuing them. Statistics of working permits are vital statistics of the school. They correspond to the death rate of the community. The usefulness of statistics of the death rate depends on how accurately the records are taken and how carefully they are analyzed. Most communities plan their campaigns of health and sanitation on the basis of their vital statistics. The statistics regarding working permits should have just as direct a bearing on school problems.

But statistics of working permits have one great advantage over statistics of the death rate. Death closes the account of a man so far as this world is concerned, but leaving school does not necessarily close a child's account so far as the school is concerned, though it has done so only too frequently in the past. The schools are now beginning to feel that it is a matter of interest and importance to them to know what happens to children who leave—where they succeed and where they fail, and how, accordingly, the school might perhaps have done better for them than it has."

The vitalizing use of these statistics in reference to school problems, Mrs. Woolly classes under the following heads:

1. Significance of number of permits issued.
2. Retardation.
3. Information of what happens to children who leave school.
4. Supervision of employment.
5. Departments of investigation and research to become the medium through which the adjustment between the Educational System and the Community is made.

It seems amazing that the School should not have constantly watched this barometer of child labor to be found in the rise and fall of the number of work permits issued each year. Indeed the ignorance of school authorities and teachers of the first step the child takes on leaving school, has been more than astonishing—a positive failure in fundamental knowledge. Such knowledge as the evasion of child labor laws by parents and children; the non-enforcement of these laws by State officials; the number of children going to work at an early age, varying with school and economic conditions; the number of girls show-

ing changed relation of the woman to industry; all of which Mrs. Woolley is now giving in the analysis of these numbers in the superintendent's annual reports.

The causes of retardation are now receiving a fair amount of consideration in many school systems, but the most patient and pains-taking analysis of facts will be necessary before final conclusions are reached.

In the initial stages of these inquiries, perhaps the zealous advocate for "vocational" work has been as hasty in his blame of the "system" as the sole cause for failure, as the critic of vocational training, to whom we before referred, has been in ignoring this group of children. In the process of Mrs. Woolley's research, we have been constantly surprised to find that inferior mental endowment constituted a very large factor in retardation—much larger than we had ever imagined.

The following general facts about retardation were given in Mrs. Woolley's last annual report:

"The table of retardation (VII) based on the standards that 14 or 15 years is normal for the completion of the eighth grade, 15 or 16 years for the completion of the first year High School, etc., shows that for this year the proportion of retardation among children from the public schools who received employment certificates was 75.2% for boys, and 85% for girls, while from the parochial school it is 50% for boys and 86.3% for girls. The percentage of retardation for the last four years is summed up in table (VIII). It shows that retardation is always greater among public school than among parochial school applicants for employment certificates, and that in response to a change in the law the proportion of retardation fluctuates more violently at first, and recovers itself more rapidly in the parochial school, than it does in the case of the public school. These facts suggest that the parochial school regime is adjusted with direct reference to the requirements of the Child Labor Law to a much greater extent than in the public school."

Table VII

RETARDATION 1914-1915

Public School

	Normal		*Retarded*		*Ahead*		
	No.	Per cent.	No.	Per cent.	No.	Per cent.	*Total*
Boys	112	24.5	343	75.2	1	2	456
Girls	44	14.7	254	85.1			298
Total	156	20.0	597	79.1			754

Parochial School

	Normal		*Retarded*		*Ahead*		
	No.	Per cent.	No.	Per cent.	No.	Per cent.	*Total*
Boys	68	50.0	68	50.0			136
Girls	22	14.2	132	86.3			154
Total	90	31.3	200	68.5			290

Boys	592
Girls	452
Grand Total	1,044

Table VIII

PERCENTAGE OF RETARDATION AMONG CHILDREN RECEIVING EMPLOYMENT CERTIFICATES, 1911-1915.

	Public Schools		*Parochial Schools*	
Year	*Boys*	*Girls*	*Boys*	*Girls*
1911-1912	68.5	65.8	51.5	49.6
1912-1913	68.2	65.8	54.0	49.3
1913-1914	67.8	89.7	60.2	95.1
1914-1915	75.2	85.1	50.0	86.0

* In a previous report, the relative importance of mental endowment and social conditions in the problem of retardation were discussed. Through a series of mental and physical tests a close correlation between the averages of the tests and the school grades was established. There were a few exceptional cases, however, where this correlation could not be shown. Although the group was small, 28 out of 775 cases, a careful investigation was made into the social environment of these children. An interesting fact became apparent. "The fourteen year old children whose tests showed good native ability, but who nevertheless had completed only the fifth grade" had been reared in "unfortunate social conditions which caused retardation in school in spite of their superior endowment." On the other hand, the children "whose tests showed poor native ability, but who had nevertheless completed the eighth grade at fourteen years," had been placed in "favorable social surroundings which assisted them through school in spite of inferior endowment."

While such knowledge brings to our attention the keen necessity for saving the promising child through better economic conditions, we are even more greatly impressed with the suggestion that the dominating factor in retardation is mental endowment, so much so that we pause for a moment of wonder over the superhuman task we again and again place upon the teacher, without adequate assistance to gain accurate and invaluable information concerning the children as *individuals,* or at least as special *groups.*

These conclusions are further advanced in a special study of First Year High School Failures, which the Bureau has just completed under the direction of Mr. Coxe, a member of the staff. The material was a group of 81 students who had failed to pass the requirements of the first year at Woodward, and who were sent to the Bureau for mental tests. After home visits, inquiries into School conditions, conferences with teachers and parents, in addition to the tests, a preliminary report was made from which I quote:

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* Journal of Educational Psychology, November, 1915.
"A New Scale of Mental and Physical Measurements for Adolescents, and Some of its Uses." Helen Thompson Woolley. Pages 7 and 8.

As has been suggested, there are three main conditions giving rise to failure,—school conditions, mental and physical weakness of the child, and social conditions. An attempt to determine the frequency with which these are found, assigning but one course to each child gives the following results.

Table XIV

School Conditions	5
Mental and Physical Conditions	25
Social Conditions	34
Doubtful	12
Omitted	4
	80

Table XVIII

	Number	*Percent*
Mentally unable	21	26.3
Lack of educational ambition	16	20.
Parental Attitude	14	17.5
Manually Low	10	12.5
Outside Work	8	10.
Health	7	8.8
Outside Interests	7	8.8
Lack of Concentration and effort	6	7.5
Economic Pressure	6	7.5
Wrong Course	5	6.3
Poor Home	5	6.3
Teacher to blame	5	6.3
Absence	4	5.
Poor neighborhood	3	3.8
Lack of preparation	3	3.8
Latin too hard	3	3.8
Bad Company	3	3.8
Several changes of course	1	1.3
Very poor memory	1	1.3
Poor Eyes	1	1.3
Hearing	1	1.3

The significance of such minute examination into the history of children, who, disheartened by their failure in the school room, timidly or rebelliously, and without informing assistance, turn to their next and only recourse—a job—is too evident to need elaboration as a plea for the school here to assert its guardianship with time, money and intelligence.

In this connection the results we are beginning to find in the investigation for which control of work-certificates was originally asked, may be of interest. We planned a comparison between children who go to work at fourteen years, and the children who remain in school, the comparison to cover a period of five years with recurring mental and physical tests. The bearing upon child labor, educational and industrial problems would be of considerable significance, if a contribution of value were made toward their solution. 800 children in each group were the material for this study begun in 1911. The fifth and last yearly tests of the working children are completed; the fourth and fifth annual tests of school children are nearing completion. The following interesting table is given by Mrs. Woolley, as a further proof that the question of mental endowment is one which educators and those opposed to child labor must face:

"The details of this comparison, and the original data are not yet published, but the general range of difference between the groups can be stated in terms of the percent of the working boys who equal or surpass the median of the school boys. If this percent is twenty-five, for instance, it means that only one-fourth of the working boys fall in the same range as the upper half of the school boys, while three-fourths fall within the range of the lower half of the school boys. The smaller the percent, the greater the inferiority of the working group. For the boys, some representative measures are as follows:

Percent of working boys who equal or surpass the median of the school boys.

Measure *	14 years	15 years
Height	35%	31%
Weight	33	33
Vital Capacity	39	31
Grip—Right	28	24

* For a description of these tests see, "Mental and Physical Measurements of working children." Mon. Sup. 77 Pdg. Rev. 1914.

Steadiness—Right	22	11
Speed—Right	28	26
Card Sorting	29	24
Cancellation Index	49	22
Substitution (Learning Test)		
Practice pages	33	19
Test page	39	28
Rote Memory (digits)	40	38
Sentence Index	36	22
Association Time	41	28
Puzzle Box		21

A child rated on the scale constructed for working children ranks from twenty to twenty-five percent higher than he does when rated on the scale constructed for school children.

The *"after school"* happenings to children have been of no interest to the school because it considered its responsibility at an end when the child passed beyond its doors, and it was loth to acknowledge its share in the child's unpreparedness. Now, however, that we begin to hear the clamor for some means of adjusting this discrepancy between education and living, these happenings begin to take on an appearance of value, and not only for the child who goes to work at fourteen, but also for the one who stays in school until seventeen and eighteen years of age. For years this rich field of knowledge has been untouched, and all the tragedies and possibly happy histories of working permits have gone to waste. Now, we are jealously harboring every item about industries, employing children, wages, shifting of positions, and all that can be crowded into the record of the child who must report to the work certificate office for a new certificate with each change of position, as is the case in Ohio.

In her annual reports, Mrs. Woolley has presented the following statistics concerning the frequency of change in position.

Number of Working Certificates held During the Certificate Period by Children Who Began Work, from September 1, 1911 to September 1, 1912

	Boys		*Girls*		*Total*	
	No.	%	No.	%	No.	%
1 Positions only	654	51.3	505	44.9	1,159	48.3
2 Positions	336	26.4	290	25.8	626	26.1
3 Positions	152	11.9	164	14.6	316	13.2
4 Positions	68	5.3	66	5.9	134	5.6
5 Positions	31	2.4	39	3.5	70	2.9
6 Positions	14	1.1	26	2.3	40	1.7
7 Positions	12	1.0	15	1.3	27	1.1
8 Positions	2	0.2	12	1.0	14	0.6
9 or more Positions,	5	0.4	8	0.7	13	0.5
Grand Total	1,274	100.0	1,125	100.0	2,399	100.0

Facts such as these give little, if any, room for doubt concerning the necessity for the guardianship of children through direct supervision of their employment. We all agree with Mr. Bloomfield that the schools should recognize the economic waste of child labor; the interests of childhood as "unbargainable;" and only "permanent principles" in the control of children's lives. We are, nevertheless, compelled to face the stern fact before stated, that child labor *is recognized as an alternative* to school by the law and by the school, as the agent of the law, in granting the child a legal consent to go to work. Hence the schools must stand as sponsor for the period their working permits cover. The school system is undoubtedly unprepared to handle this labor question, but how long will it allow the "snare of preparation" to entangle in its meshes hundreds of helpless job-seeking children? And in spite of better organized machinery, Labor Exchanges will never handle or supervise child employment with the sensitiveness to the child's training that will be found in a Placement Department under educational authorities. Why should it be otherwise? If the individual child is worth saving in the school by special classes and efforts, the individual working-child in the impressionable years of habit-forming and adolescent growth is just as valuable to the community. How can

he possibly gain the disciplinary lessons of regularity, concentration and obedience, unless he is placed in the best job to be found, and his successes and failures carefully watched and turned to some advantage for him. It may mean a conference with parents, an adjustment of menacing conditions with the employer, a securing of special training to advance the young worker in a skilled trade. Or through the opportunity of talking with a child about the work which he needs or wants, again and again comes the chance of either persuading him to go back to school, or making it financially possible.

The data secured through this Placement Department, we have found of great value, and not to be obtained through *any other source.*

For instance in the matter of wages. The following table shows the data we secure from the work-certificate department:

Wages, September 1, 1913 to August 31, 1915

Wages per Week	Boys		Girls	
	Number	Per cent	Number	Per cent
Under $2.00	11	1.05	9	.74
$2.00-2.50	12	1.14	78	6.5
2.51-3.00	90	8.6	161	13.3
3.01-3.50	135	12.8	134	11.1
3.51-4.00	146	13.9	153	12.7
4.01-4.50	86	8.2	75	6.2
4.51-5.00	113	10.7	99	8.2
5.01-5.50	20	1.9	10	.83
5.51-6.00	27	2.5	48	3.9
6.01-6.50	6	.57	4	.33
6.51-7.00	5	.47	8	.66
7.01-7.50	2	.19	1	.08
7.51-8.00	2	.19	6	.49
Over $8.00	3	.28	5	.41
Hadn't Asked	189	18.1	233	19.3
Piece Work	161	15.3	146	12.1
Home	39	3.7	32	2.6
Asked but evaded			2	.16
	1,047	99.5	1,204	99.6

In the placement Department such data are doubly checked through direct contact with the child in securing his job, and with the employer. The same is true of industrial conditions. Through this channel we also secure a monthly report of each child's progress in his position, and an estimate of the child's ability in the report given by the school. Because intensive and supervisory placement is of recent origin in Chicago, Boston and Cincinnati, we cannot yet prove our belief—which is that definite results in the well-being of the child will be brought about by this means.

We have spoken of the opportunity through the Placement Department of persuading children to return to school. Connected with this persuasion is the ever present financial problem. The resources to which we can turn for aid in this respect are both public and private in Cincinnati. Ohio *has a Child Labor Relief Law (Section 7777—General Code) which provides that when a truant officer is satisfied that a child compelled to attend school by law is unable to do so because required to work in order to support itself or help support others legally entitled to its services, the truant officer shall report the case to the Board of Education. It shall then be the duty of said Board to furnish text books free of charge and such other relief as may be necessary to enable the child to attend school for the required time each year,—the expenses incident to be paid from the contingent fund of the school district. Such child shall not be considered or declared a pauper by reason of the acceptance of this relief. In case the child or its parents or guardian refuse or neglect to take advantage of the provisions thus made for its instruction, the child may be committed to a Children's Home or a Juvenile Reformatory.

The last annual School Report states that the amount of $2,348.01 was expended by the truancy department during that year in the purchase of shoes, stockings and eyeglasses. In former years monetary assistance to the expense of $1.00 or $2.00 a week was furnished.

This seems to be a suggestive beginning for a form of guardianship as greatly needed as that of the school system, but the admin-

* In 1911 when I gave a brief report to the Child Labor Conference on this subject, Michigan and Oklahoma also had Relief laws.

istration of monetary relief is so far from perfection that we are all fearful of attempting this process of education. In Cincinnati no adequate provision has been made for the careful investigation of these relief cases, and there is no attempt to handle these funds as scholarship funds. Why should not this assistance be given as the state of New York now confers scholarships for college? Why should not the attempt be made to secure through these applications a wide knowledge of the financially handicapped child? Pauperization could not only be avoided, as the use of private funds has demonstrated, but the independence, ambition, and moral well-being of the child could be infinitely advanced through the wise administration of pecuniary assistance.

Aside from this somewhat uncertain dependence, private funds are becoming more common for such uses, the availability of which should be known to the schools, and if more information could be given by the schools concerning the needs in this direction, more money would be released for the education of individual children. The Schmidlapp Fund began such assistance several years ago, and the splendid accomplishments of the Committee on Vocational Scholarship of the Henry Street Settlement are establishing beyond doubt the definite results of monetary aid.

Our Fund is now administering $6000 per year, about one-third of which is expended for children below eighteen years. In Cincinnati we have 2000 children leaving school each year; at least 5% of this group are of superior mental endowment even as compared with children who remain in school. A report on home conditions of the children who passed through the Bureau was made by Miss Boswell of our staff for the Child Labor Committee, showing that 28% of the children who went to work at fourteen years, were in dire financial need. But we know that many children of great promise, do not yield their full contribution to the community because of our failure to provide effective training. The data on home finances is appearing from time to time in Mrs. Woolley's reports, a valuable table of incomes being published in the last school report.

If space permitted numbers of instances could illustrate this need. Last July a young, frail, timid girl was sent to me from

the Placement Office. A few months before, she had left the third grade of High School in which she showed much promise, because a partly insane father had refused support to her mother, herself and small sister. In desperation she had borrowed money from a questionable Loan Company to pay her tuition in stenography. The Loan Company was mercilessly pressing the matter and the child having endured for years the cruelties of the father and the nerve racking despair of the mother, was herself almost frantic. We immediately paid off the loan and her tuition and she is now hoppy in a position earning $10.00 per week with a rehabilitated home. We hear constantly of the self-made man who went to work at twelve years of age and without education made a success, but the tragedies of the children who have fallen by the wayside because compelled to work at twelve years and to abandon the opportunity for training are yet to be written.

We began our experiment in Cincinnati with private funds gradually increasing the staff under Dr. Woolley, until the budget reached $10,000 a year. One half this annual amount has recently been assumed by the Board of Education.

The making of a school budget is extremely puzzling and the distribution of funds often transferred by a lack of intelligence on the part of the tax-payer. He is generally content without results which come from attention to the needs of groups of children and which seem, because of their newness, useless and extravagant. A progressive superintendent presents the needs as he finds them, first to a Board, some, if not many, of whose members, using their position for a political stepping stone, have no conception of educational values, and are constantly in fear of loss of popularity. The second tribunal may be a County Tax Commission who are wofully ignorant of school matters. In consequence, if the superintendent worries through these discouraging ordeals with one half his plans realized, he considers himself fortunate. A recent tax-assessor told a tax-payer he "was done with the new-fangled schools; for they were now finished in solid mahogany, rubbed and dressed, and then covered with felt!" The editor of an influential paper, an intelligent and broad minded man, was not favorable to a school Budget, because a certain innovation had been introduced at great expense. When

told this expense amounted to $200 per year, he admitted his ignorance of its purpose as well as its cost. The problem is the old weary story of municipal waste and a disheartening lack of intelligent interest on the part of the public. The theory of the farmer, with the wretched and miserably inadequate rural school within a stone's throw of his well kept modern farm, that the little red-school house of his boyhood is good enough for any body, if found all too generally among citizens of a congested city; neither the farmer nor the citizen comprehending the needs and complex environment of the present wage earning child, any more clearly than the classical professor, who writing from his laboratory far removed from the economic and industrial struggle into which we plunge our perplexed children at fourteen years of age, often puts forth theories impossible to use. As Boards of education are granted revenues of increasing value by the popular vote, their personel should also be one of increasing efficiency and intelligence. Then, they should not only be given liberty to try out needed experiments, as any effective business must do, under wise superintendence, but they should be commanded by a public, which recognizes children as an asset, to guard, train, and guide *all* its children till eighteen years of age, and not merely the one tenth who are able to remain within school rooms.

In a recent talk on vocational guidance, Mr. Judd told of the small boy who protested to one of his many examiners in the process of his guidance: "I don't know what you're after, Mister, but I've got it!"

That he has "got it," in spite of our systems and blunders makes us hope we may sometime release, through training, a power heretofore unknown either to child or to teacher, and protect through guardianship the spirit of youth which alone preserves for us the "warmth and value of life."

The Teaching of History—The Note-Book and the Recitation

By A. S. Martin, Superintendent of Schools,
Norristown, Pa.

EACH student prepares a note-book by recording during the study period, or prior to it, the key sentence of each important paragraph. Complete sentences only are recorded. All the sentences taken together constitute a very concise statement of the history of the lesson. If the record is made prior to the study period, the key sentences are the points about which the historical facts of lesser importance are mentally grouped during the study period.

When the class has covered a more or less definite and integral part of the course of history such as a period of exploration, settlement, internal improvement, a war, or the decline of a nation; the student arranges the key sentences into a brief logical outline which constitutes his summary of the history of a given period. This gives him a fine training in logical synthesis. The selection of the key sentences trains his analytic powers.

The arrangement of the key sentences into a paragraph or two which give a brief but full appreciation of the history of a given period trains the constructive powers of the student. When the teacher performs the analysis and constructs the outlines and passes them on to the student for memorization, the teaching, if any, is poor indeed.

The student also records history-maps on which he indicates important historical places. No one can become intelligent in history without a thorough knowledge of the geography basic to history. A map drawn in a few minutes is more contributory to history than one whose motive is art and which sacrifices time to ornation. The student should acquire the ability to draw important maps from memory. The map-drawing of the student, however, will not take the place of the regular class-room maps.

These have their distinctive use during the progress of the history recitation.

Teachers of reputation use the commercial outline maps and force much labor on students by requiring them to copy on them many details. I have known the author of this type of maps to teach history and to have an equal interest in the sale of his maps. That the compilers of the history outline maps gained valuable knowledge is certain. That the use of these maps deprives the student of the most valuable training in history-geography is equally true. It sacrifices constructive training to copying. Instead of exercising the power of visualizing geography and the ability of constructing maps from memory when needed, it makes the student dependent on the small, time-killing, commercial outline map.

The introduction to each day's notes consists of the date and a definite statement of the lesson. The note-book is intended for present and future reference. It is particularly important that high school students preserve their note-books. The best institutions of higher learning allow only one-half full credit for history unless the student presents a satisfactory note-book. The note-book should be neatly and carefully written. Care should be given to the legibility of the writing as well as to the spelling and punctuation. The quality of the notes is of greater importance than their quantity. The teacher should examine the note-books and indicate the fact. On the basis of this examintion, appropriate suggestions for the improvement of the notes should be made.

During the recitation the text-book, as a rule, is closed. The students are permitted, however, to refer to their notes during the recitation although they are encouraged to be independent of all lesson helps. The value of the course of history lies in the training which the student obtains in differentiating the important from the less important historical facts. Memory of facts without the appreciation of their relative importance is not history knowledge. The aim of the teacher is more intelligent notes quite as much as the memory of historical facts. Practice in definite differentiation increases the student's ability to understand history. The volunteer does not eliminate others from re-

citing. Each student holds himself responsible for a contribution to the recitation at any moment.

There is some value in giving the class a test in spelling of absolutely essential words of history. Such a test is given at intervals and improves the spelling of the students in their notes and reviews. The test occurs bi-weekly. The student is not required to write the misspelled words ten times. However, he is required to learn how to spell them.

In classes where the periods are of one hour duration, the first half of the period is devoted to directed study. In the elementary schools, the periods are thirty minutes and every alternate day has either a study period or a recitation—directed study today and the recitation at the same hour tomorrow. Students are encouraged to amplify their notes by reference to the library and magazines. The teacher rates the work of the student on the basis of the note-book, the recitation, an essay on an assigned subject, and the reviews which take place at the completion of definite periods or epochs of history.

Physical Training and Scholarship

By Edith L. Hilderbrant, Harvey, Illinois.

IN writing of the physical training at Aldershot, England, Dr. R. Tait McKenzie, Major of the Royal Army Medical Corps, says, "The training is not so much physical, although that is what it is called, as mental. It is a brain-quickening training; it enables men to assimilate instruction in their other work more rapidly than before."

His statements are undoubtedly true, not simply of the work with soldiers, but of all physical training which has for its aim the conservation of vital force. Research work in schools and universities bear out the above conclusions. A recent investigation carried on among the girls of the Thornton Township High School, Harvey, Illinois, throws the weight of its evidence onto the positive side of the question at issue. The practical means by which an endeavor is made in this school to accomplish the true aim of physical education are:

1. Correcting physical defects.
2. Teaching the principles of hygiene.
3. Establishing co-ordinations that render the body subservient to the will.

In the Harvey school, physical training is required, except in cases where girls submit medical certificates saying they are not physically fit to participate, or where conflicts with other subjects allow them no opportunity to get into the gymnasium classes. Each class meets three times per week.

Grades in physical education are based upon:

1. Attendance.
2. Order.
3. Ability to do certain things well.
4. Improvement in ability.
5. Special work outside of school hours.
    a. Playing on teams in inter-class games.
    b. Helping to make departmental work like evening lectures a success.

c. Dancing, swinging clubs, and so forth, on special school programs.

6. Increase in lung capacity.
7. Improvement in posture.
8. General physical improvement.

The nature of the items shows that credit for a number of these things, for example, participation in interclass games, is given not as an incentive, but as a mark of recognition of good work well done. Really no incentive is needed; in fact, it is almost impossible to arrange for sufficient games to accommodate all of the girls who want to play. Yet there are some who are physically unable to participate, and others who would not play if they could. No deduction is made from their grades. Either their earning capacity is not so great as that of the others, or else they are not approaching its limit. In either case, they earn and receive credit for work done,—for achievements made.

It is probably more nearly true of physical training than of any other school subject that girls either like it very much or they do not like it at all, those who like it least invariably needing it most. There are comparatively few who show an indifferent attitude.

At the close of last semester the fifty girls having the highest grades in physical training were compared in scholarship with the fifty who held lowest rank. The following charts made from the office records bring out rather strikingly the fact that those who did good work in physical education, were the pupils who accomplished by far the most in the academic subjects. Letters are used for grades, A, representing 100 to 95; a, 94 to 90; B, 89 to 85; b, 84 to 80; C, 80 to 75; c, 74 to 70; and F, failure. Standings in the formal studies were given out every four weeks for five months. The grade in physical training is the semester grade.

GRADES OF FIFTY PUPILS RANKING LOWEST IN PHYSICAL TRAINING.

No. of Pupil	*Phys. Tr. Grade*	*A*	*a*	*B*	*b*	*C*	*c*	*F*	*Exemptions*
1.	F	2	7	4	9	3	2	3	0

2.	F	2	1	5	9	4	2	9	0
3.	F	0	7	10	15	6	2	0	3
4.	F	0	4	9	6	3	2	1	0
5.	F	1	5	10	6	1	1	0	0
6.	F	0	0	7	8	6	0	9	0
7.	F	1	5	12	4	3	0	0	0
8.	F	0	1	5	11	7	2	1	0
9.	F	2	6	4	5	2	3	6	0
10.	F	5	5	8	4	2	0	1	3
11.	F	0	2	9	9	8	4	3	0
12.	c	3	15	12	0	0	0	0	6
13.	c	0	0	3	5	5	0	10	0
14.	c	0	0	10	9	9	4	2	0
15.	c	0	0	5	6	3	4	14	0
16.	c	0	0	2	4	5	11	12	0
17.	c	0	0	10	15	3	0	2	0
18.	c	2	11	9	5	3	2	1	3
19.	c	0	0	0	1	5	3	12	0
20.	c	0	8	6	9	8	3	1	2
21.	c	0	1	5	3	7	7	12	0
22.	c	5	17	4	3	1	0	0	4
23.	c	0	0	1	5	11	5	13	0
24.	c	1	10	21	3	0	0	0	5
25.	c	0	0	15	7	5	6	2	1
26.	c	1	16	2	1	0	0	0	4
27.	c	8	12	9	1	0	0	0	6
28.	c	1	6	5	5	4	3	5	0
29.	c	0	4	6	10	8	1	1	1
30.	c	0	4	6	11	4	1	3	0
31.	c	3	11	4	4	3	4	1	4
32.	c	1	7	15	5	2	0	0	4
33.	c	0	0	6	12	12	0	0	0
34.	C	0	0	3	3	7	9	8	0
35.	C	3	11	7	8	1	0	0	4
36.	C	2	9	10	6	2	0	1	2
37.	C	0	0	5	7	6	5	7	0
38.	C	7	12	4	2	0	0	0	4
39.	C	5	3	16	9	2	0	0	3
40.	C	3	4	11	8	2	1	1	1

41.	C	0	0	13	9	2	3	3	0
42.	C	2	7	10	5	1	0	0	3
43.	C	0	8	12	5	0	0	0	3
44.	C	3	7	6	5	4	3	2	3
45.	C	11	16	3	0	0	0	0	6
46.	C	2	16	10	6	1	0	0	4
47.	C	0	0	3	9	4	4	10	0
48.	C	0	12	9	3	1	0	0	4
49.	C	5	15	8	2	0	0	0	5
50.	C	1	0	3	6	6	4	9	0
		82	285	372	303	182	101	165	88

Grades of Fifty Pupils Ranking Highest in Physical Training.

No. of Pupil	*Phys. Tr. Grade*	*A*	*a*	*B*	*b*	*C*	*c*	*F*	*Exemptions*
1.	A	5	8	5	5	1	0	0	4
2.	A	0	5	11	7	5	2	0	2
3.	A	0	1	3	13	8	0	0	0
4.	A	0	8	8	17	1	1	0	2
5.	A	0	13	4	4	0	0	0	4
6.	A	4	6	9	9	2	0	0	3
7.	A	13	16	1	0	0	0	0	6
8.	A	21	4	5	0	0	0	0	5
9.	A	9	14	11	0	1	0	0	7
10.	A	2	1	5	12	4	3	3	0
11.	A	1	10	14	0	0	0	0	2
12.	A	4	11	6	9	0	0	0	3
13.	A	8	14	6	2	0	0	0	6
14.	A	0	0	4	11	3	6	1	0
15.	A	4	20	9	1	0	1	0	7
16.	A	0	0	2	4	7	6	11	0
17.	A	3	7	5	5	3	4	3	0
18.	A	3	6	18	2	3	1	0	3
19.	A	0	0	1	6	4	3	16	0
20.	A	8	4	12	6	0	0	0	3
21.	A	2	21	6	0	0	0	0	6

22.	A	15	13	2	0	0	0	0	6
23.	A	1	16	11	7	0	0	0	5
24.	A	12	19	4	0	0	0	0	7
25.	A	0	3	7	10	4	5	1	1
26.	A	5	9	6	0	0	0	0	4
27.	A	0	3	11	9	2	0	0	2
28.	A	1	9	10	11	3	1	0	3
29.	A	1	3	10	6	6	2	2	0
30.	A	5	14	5	1	0	0	0	5
31.	A	0	1	2	4	5	8	7	0
32.	A	3	15	5	6	1	0	0	5
33.	A	6	12	14	2	1	0	0	4
34.	A	0	18	12	0	0	0	0	5
35.	A	0	2	9	8	5	1	0	1
36.	a	14	12	2	2	0	0	0	6
37.	a	0	1	8	15	3	7	1	0
38.	a	0	1	6	9	5	7	2	1
39.	a	1	3	2	10	5	4	4	1
40.	a	0	5	9	16	3	2	0	0
41.	a	3	21	3	0	1	1	1	6
42.	a	3	5	7	9	1	5	0	2
43.	a	0	2	8	11	5	0	4	1
44.	a	0	4	4	15	3	2	5	0
45.	a	1	6	12	8	2	1	0	3
46.	a	4	2	6	9	4	0	4	0
47.	a	4	6	10	6	3	1	0	3
48.	B	0	3	12	12	5	2	1	1
49.	B	12	8	0	0	0	0	0	4
50.	B	23	2	0	0	0	0	0	5
		201	387	342	299	110	73	67	144

It is apparent at a glance that the "high fifty," as we shall call them because of the convenience of the name, far excel the "low fifty" in scholorship.

There is only 1 real student in the low fifty; or rather there *was* only one, for she is not living today; there are only 3 who really rank low in the high fifty.

4 pupils in the low fifty were exempt from all of their examinations, in the high fifty 14 were exempt from all.

Only 26 girls in the low fifty received A's, the total number being 82. 32 in the high fifty have them, the total being 201.

35 girls in the low fifty received 285 grades between 90 and 95; 387 of such grades were given to 47 in the high fifty.

In the number of grades between 70 and 90 the low fifty take the lead, the difference being only 34 between 80 and 90, and increasing to 100 between 70 and 80.

Once more the low fifty lead; they have to account for 165 failures, while the high fifty have only 67.

Then again the high fifty leap to the front. They have 144 exemptions, while the low group have only 88.

A quick comparison of the grades is afforded by the following brief summary:

	A	*a*	*B*	*b*	*C*	*c*	*F*	*Exemptions*
Low Fifty	82	285	372	303	182	101	165	88
High Fifty	201	387	342	299	110	73	67	144

A small investigation of this sort conducted in a single high school bears little weight no doubt in the educational world, since the evidence is by no means conclusive. This test will be repeated at the end of the present semester. Even if similar results should be found for several terms, not only in one but in scores of high schools, we might dismiss the whole matter by saying that the "high fifty" in each are naturally brighter than the "low fifty"; that they are better students all around, therefore better in physical training; and that they, because of superior intelligence, are destined to lead civilization's van while the others must stay behind to do the world's chores. "Somebody has got to do 'em."

Is it not a grievous error thus to give full credit to physical endowment? A person in the lower class may have latent physical and mental resources as great as, or even greater than anyone in the upper group. The very apparent difference lies in the fact that he is not husbanding his resources, and that he is not developing his powers while yet there is opportunity. The gulf between the two is not nearly so unfathomable as it seems. It is really only a narrow chasm that has been bridged and can

be bridged again by any one who exerts sufficient will power to enable him to cross to the other side.

If his will power is weak, let him take physical training to strengthen it. As some one has said, "physical training in developing the capacity of self-direction and self-control in the pupil, of necessity develops the will. The child, who is so educated physically as to discover that he has gained complete command of what would have remained an awkward and uncouth body soon learns from the masterly control of a well knit physique to overcome all obstacles. He develops an unflinching will, a sanctified, unfaltering purpose; he became a true vertebrate."

How many people there are who occupy a lower station in life than they would have had they received sufficient physical education to develop certain brain centers. True, they do not complain of ill health, and they are apparently well. But they are unable to engage in activities than call for a finer and higher adjustment in life. If they have passed the developmental stage, it is not likly that they will ever complete their physical development, and consequently they will never attain the heights which were originally within their power of reaching.

Physical training gives a pupil a chance to find himself. Obstacles that seemed impossible to overcome at the beginning are cleared with success, and soon the individual develops a self-confidence which manifests itself in all he undertakes. The inability is not real in the first place. It exists only as a result of habitual thought and action. A few of the innumeberable neuro-muscular movements are required to show one his resources and his capabilities.

Besides helping the youth to take inventory of his stock in trade, physical training, coming in the midst of more arduous work, affords relief from mental strain. Modern efficiency tests show that much more can be accomplished in a given time if the worker is allowed to rest half of the period. If this is true of purely physical labor is it not reasonable to conclude that occasional rest for the mind would enable the individual to accomplish more than if mental effort were sustained?

The student who goes from his study to the schoolroom and directly back again, dulls his comprehensive powers by the process of over-burdening. In trying to grasp new ideas, he is

obliged to make increasingly greater effort. He soon reaches a place where his body demands attention from his mind. Both body and mind become less efficient from day to day, until, at the end of the course, the student crawls from the school a mere bookworm with no real purpose in life, and with no physical foundation upon which to base an aim if he had one.

He lacks courage; *that* goes with strong vigorous heart action. He is peevish and irritable, for his stomach is out of order; and no wonder—the blood that should have helped to assimilate food was forced to serve an already impoverished brain. He sees only the dark side of life; little air gets into his lungs and less sunshine into his soul. Instead of being happy, optimistic, and carefree, he is depressed by the thought of danger ahead, by a gloomy foreboding of ill,—and this, because his body is weighed down with a load of ashes and clinkers that a little joyous play would have helped to eliminate.

With the trend of life thus directed downward, one becomes more and more susceptible not only to germ infection, but also to that type of psychic inoculation which tends to lead him from the beaten path of truth and right. Resistive power of every kind suffers a very perceptible decline, and temptation overpowers the once resolute and sturdy youth, simply because his false notions regarding mental development have brought on physical deterioration which in turn has rendered the mental processes weak and capricious.

There is constant action and reaction of mind upon body and body upon mind. If a person preserves a cheerful, happy disposition, the body will give evidence of it. The improved physical condition will give clearness to the mind, which will favorably influence the physical state. Each cause produces a certain effect and each effect gives rise to another cause. Just as a person with an excellent constitution finds it easy to develop mind and body, so his weaker brother may fail even after the expenditure of great effort. Nowhere in life do we find a more strict adaptation of the Scriptural truth, "To him that hath shall be given; and from him that hath not shall be taken away even that which he hath."

There is a certain mental exhilaration which results from physical exercise, that stimulates one to greater mental effort.

The wits are burnished; the perception is quickened; one is enabled to *think*. Exercise increases the capacity for intense, prolonged mental application. Furthermore, it broadens the grasp, and strengthens the power of retention. A little "pause in the day's occupation" gives memory a chance to fix the facts previously learned.

The effects produced by exercise vary with the individual whose condition should govern the nature of the activity in which he engages. A languishing brain can be stimulated into action by difficult movements that call for close attention and considerable effort. The same exercises given to one who is suffering from mental overwork, would not only increase the nervous fatigue, but would add muscular fatigue thereto. His condition demands simple automatic exercises, such as occur in gymnastic work previously learned. Walking, rowing, and playing games are especially good. Recreation not only relieves the thought mechanism, but it also calls into play nerves and muscles that would otherwise have no activity and so would fall into disuse.

And this brings us to a consideration of the fact that the actual growth of the brain is dependent not only upon mental activity, but also upon motor activity. Muscular exercise develops the portion of the brain which presides over voluntary movements. The nutrition of the cells concerned in sending a message to the muscle is influenced by the process, just as the nutrition of a muscle is affected by its contraction. The nourishment of the brain and consequently its growth and development depend largely upon the quantity and quality of the blood furnished to that organ. So we have it within our power to actually increase the size of the brain and to develop certain definite aptitudes and powers by simply calling upon certain cells to perform their functions.

Muscular activity stimulates the portion of the brain which governs it; conversely, a lack of exercise permits the cells concerned with voluntary movement to deteriorate. The brain may actually diminish in size and capacity. It has been repeatedly demonstrated that certain sections of it have atrophied after the removal of a limb. In the case of Laura Bridgman, who could neither see nor hear, localized atrophies were found in the brain. Disease of the body may arrest the development of the mind, which usually becomes normal after the cure of the ill.

Muscular activity then develops the motor area. Furthermore, it aids in the development of the intellect since the motor centers are directly connected with the highest intellectual centers. The cells are closely associated, and one acts and reacts upon another just as the mind and body influence each other. Stimulation of the motor center necessarily awakens and arouses the mental centers into activity. The more varied the movements, the greater the chain of association centers developed.

Physical education is the means to the end. It furnishes activity, which is the keynote to right living and to full mental development. Modern systems of education recognize the fact that impressions in order to be physiologically complete must find expression in some kind of activity. Only these have a lasting influence, and are really effective in making preparation for life.

Underlying the best methods of teaching are the principles which demand that motor activity shall accompany mental effort in order to produce a lasting impression. Some muscular movement such as is experienced in reading, oratory, voice culture, instrumental music, dramatization, even though it be only speaking or gesturing, helps to clinch the idea. We do not fully appreciate the important part that the hand plays in our mental operations. Some one writes, "It was the hand, wonderful mechanism, evolving out of the directing will an ever increasing subtlety and power, that made possible the human brain." Proper exercise of the hand in arts that are useful and beautiful, is reflected by the mind.

The action of the tongue is, perhaps, a no less essential element in the education of a brain. The varied expressions produced by the muscles of the tongue, hand, larynx, eyes, mouth, in fact, the entire countenance, if not of the whole body, are indications of the superiority of the mind of man over that of animals. The progress that has marked the human race in every step of its evolution has been characterized by the performance of movements more and more complex, and by a correspondingly finer structure of nervous tissue with its resultant nice adjustment of life.

We cannot emphasize too strongly the relation between motor activity and mental development. "We learn to do by doing." The body expresses the idea that is in the mind; a reaction occurs which gives the effect of durability. There is a definite chemical change in the tissue which is an evidence of mental

development. Were there no opportunity for motor activity, there would be little change in the tissue and consequently little development of the intellect.

The fact that physical training keeps the body in good health, is also important. With an abundance of red corpuscles, supplied by good heart action and well developed lungs, a person is certainly much more capable than the "stuffy" individual who never draws more than a tenth of a breath at each respiration. A test at Harvard shows that the people who hold scholarships are superior to the student of average rank not only mentally but also physically. It is reasonable to expect those who have the best physiques to do the best mental work. Mental perfection naturally follows the cultivation of physical perfection. If physical development is suppressed, any attempt to perfect mental development is vain. The monks of old who so zealously degraded the body were in no wise elevating the mind by the process. The ancient Greeks, whose school curriculum consisted largely of physical education, were, the historian says, "as superior to us in intellectual ability as we are superior to the African negroes."

Many see no relation between mental development and physical training. The mind is looked upon as an entity. Physical training is regarded as a distraction which interferes with the action of the knowledge pump. It is tolerated by people who do not understand its value simply because certain educators are promoting it, and it seems the conventional thing to have, or to "take," as the case may be.

The misconceptions have doubtless arisen from the effects of the abuse of exercise. Because it has taken some people such a long time to get far enough away from savagery to realize that might no longer makes right, brute force, even in recent stages of evolution, has been getting plenty of emphasis. The impression left in many minds by such practice has not been displaced by the correct theories regarding physical education.

To be sure, the development of large muscles is not a worthy aim. Any effort to become "a physical marvel in four days," by correspondence, or in any other manner, should be discouraged. The counterfeit strength which large muscles represent and which has been procured probably at the expense of other organs, is of little value in the conservation of vital force. The

high development of mental power is the result not of large muscle movements but rather of diverse, co-ordinating movements.

We really do not wish to declare that mental training is misnamed physical, since physical training as such has its own high purpose in helping to perfect the individual, but we do wish to state most emphatically that the betterment of the human race depends largely upon the physical education of its youth. Who can say that the exigencies occurring in a trigonometry lesson are any more applicable to daily life than those that must be met in a game of basket ball? What evidence have we that the knowledge that "Gallia est omnis divisa in partes tres" puts one any more into harmony with his or her environment than does the grace to express one self in an aesthetic dance?

A revaluation of the methods by which we endeavor to achieve our aims will be essential to the full development of the human race. To accumulate a mass of knowledge without acquiring any manner of expression is to selfishly waste a life on oneself. Man is judged by what he expresses to the world, in one way or another. For the ideas that appear daily upon the field of consciousness, we must, through physical education cultivate a means of expression. And here let it be said that physical education is concerned not simply with the activities of the gymnasium, but also with those of manual training, household arts, music, literature, everything that gives opportunity for the joyous unfolding of noble character.

Exercise as exercise cannot be discounted. It would hold a high place even though its only purpose were to promote health. Health is the individual's chief asset, but he usually does not know it until he has lost it. Health of body contributes to health of mind and of morals. It discloses the rock upon which we may build. Without a firm foundation there can be no substantial superstructure.

In our upward climb, let us not fail to keep ever before us the highest ideals; let us not lose our sense of values in an effort to amass a quantity of facts that will tend to impede instead of aid our progress; let us rather, through the medium of physical education, take unto ourselves abundantly the offerings of heaven and earth, and this, not with the purpose of promoting self, but with the aim of expending upon the world a vast amount of power consecrated to others.

Outline of Chemistry in its Relation to Industry and Commerce

By Mary E. McKean, Elyria, Ohio.

EXPLANATORY.

THE use of this Outline in connection with the regular text book by students of industrial history, commercial geography, chemistry, and manual courses, will prove helpful and suggestive in showing the relation of chemistry to industrial and commercial development, at a time when rapidly changing economic conditions have given new impetus to the subject. The attempt to present the subject by simple, direct method, devoid of technicalities, will appeal, it is believed, to original thought on the part of the student, and encourage him to make his own investigations to the end that he may become better acquainted with shop and factory conditions in his own locality and plan a course of reference reading to broaden and supplement the class room instruction.

The science of chemistry in its adaptation and application to the modern industrial and commercial world plays a part so important that it now ranks in its far reaching effects next to the development and application of power in economic usefulness. The chemist's laboratory and the workshop and factory join hands in this development and are mutually interdependent. For example, the chemist produces the painter's colors, dyes for the weaver, tans for the tanner, fertilizer for the tiller, ink for the printer, dynamite for blasting, chemicals for fluxing and reducing ores, drugs and medicines for the apothecary and the physician, and other materials and commodities without number. Almost daily the discovery of some new chemical is heralded, some old device so improved and perfected that another laboratory experiment has become an industrial process with the result of increased efficiency in manufacture and a rapid decline in the cost of chemicals with a corresponding rapid increase in their output. Before the present warring conditions in Europe, Ger-

many led the world in what might be called "Industrial Chemistry."

This leadership was due in a large measure to the thoroughly efficient character of her schools, to the initiative and intelligence of her people, and especially because her universities had developed the science of chemistry, through direct government aid and encouragement, for decades before it was given particular attention in any other country. The trained chemist of the German university very soon found employment in German chemical works, shops, and factories, and thus gave Germany her easy leadership over all other countries. Since 1880 many German chemists have found employment in England and America, and many Americans trained in Germany, have returned to their own country to give new energy to the development and application of industrial chemistry.

Especially since the war we find that in America chemistry and the chemical industries have received a new interest and importance since we must now depend upon home production for many drugs and chemicals that we formerly bought in the German market. The American chemist has been able to meet this demand in part and to an extent worthy of commendation. But still urgent need has not been supplied in many instances. Take for example one of the most typical chemical manufactures in its scientific nature, its importance, and its relation to other industries, that of dye stuffs. These are manufactured almost entirely from coal tar, one of the by-products of the by-product coke oven, and Germany holds the secret of coal tar dye production. This has worked a great hardship to the American textile manufacturer since the beginning of the present war, as the American dyes are not fast nor of fine shading so cannot be sold under guarantee. The failure of the American chemist to produce reliable dyes from coal tar is not so much a matter of want of knowledge and skill, on his part it is agreed, as it is a want of proper laboratory equipment, for many of the delicate scientific instruments and intricate devices and developments found in the laboratories of Germany are protected from infringement by the government and their foreign sale prohibited.

This little study outline is prepared to serve as an aid, and

simple up-to-date exposition of the application of chemistry to industrial problems and commercial development that intimately concerns the student of Industrial History and of Industrial Geography.

THE OUTLINE.

Part One.

RAW MATERIAL AND CHEMICAL PRODUCTION.

1. Grouping with regard to importance: (a) Major chemicals, (b) Minor chemicals.

The chemical industry, like the textile, has a few raw materials of great importance grouped as major. Among these are, Sulphuric Acid, Soda Ash, Nitrate of Soda, Potash Salts, Ammonia, and Coal Tar. A host of raw materials of lesser importance in industrial chemistry is grouped as minor. Some of these are, Essential Oil, Synthetic Perfumes, Gums, Nux Vomica, Strychnine, Shellac, etc.

2. Grouping with regard to nature of substance: (1) Acids, (2) Alkalies.

(1) Sulphuric acid is the most important of the acids, and is the chief manufactured material used in the making of chemicals. For this reason it is often referred to as the "chemical barometer." It has been said that one may gauge the civilization of a people by the amount of sulphuric acid they use.

(a) Process of manufacture,—Simple, from sulphur and water.

(b) Cost of production,—fraction of a cent per pound.

(c) Amount used,—22 pounds per person per year in the United States.

(d) Source of supply,—Sulphur ore from the Rio Tinto and Tharsis mines near Huelva, Spain, which together sent us a million tons in 1912. Small quantities also from Italy, Portugal, and from Pilly's Island, Newfoundland.

(e) Uses,—Used extensively in fertilizer factories, and to some extent in all chemical works. The rapid increase in the amount produced in the North Central states shows the development of the chemical industry in that section of country.

(2) Alkalies,—a Soda Ash (sodium bicarbonate) most impor-

tant of alkali substances considered industrially; used in the manufacturing of soap, glass, and various chemicals. It is chiefly made by the Solvay process, a Belgian invention that has been instrumental in cheapening the process production of all alkalies. The sodium in the soda ash is furnished by common salt, in the form of brine secured either from salt springs, or from the unique method of pumping water down through the earth to the salt deposits through one pipe and forcing it out by another after it has done the work of a miner by dissolving the salt hundreds of feet below. Coal, coke, and limestone are used in the production of soda ash. The plants are usually located where salt and limestone both exist. Chief works are at Syracuse, N. Y., Detroit, Mich., and other points along the salt strata of these two states. The increase of production in the United States of this chemical product of wide usefulness had caused a great decline in its importation from Germany even before the war rendered its exportation practically impossible. Certain lakes in the western arid region, especially in Nevada, are highly charged with soda ash to be obtained by evaporating the water; a similar lake at Megada, East Africa has dried up, leaving a vast bed of crystalline soda. These lakes with their millions of tons of soda ash have remained unutilized because it is cheaper to make it near the place of consumption.

II.

THE FERTILIZER INDUSTRY

This industry, devoted to the production of chemical plant food, is the heaviest of all chemical industries in the United States. The chief chemical substances used as fertilizers are,—phosphorus, potassium, and nitrogen.

The first article extensively used as a commercial plant food was Guano, the excrement and skeletons of sea birds that had lived and nested in places where the rainfall is insufficient to dissolve and wash down deposits.

Place yielding largest quantities:—Chincha Islands off the desert coast of Peru, where through long years millions of sea birds had lived and nested. Amount and value:—Between 1830 and 1880 about $600,000,000 was exported to Europe and to United States, selling at from $30 to $60 per ton. But since

1880 the place of guano as a fertilizer has been quite largely filled by chemicals from widely different sources.

1. PHOSPHATES

The bulkiest, cheapest, and possibly the most important of plant foods, are the phosphates which furnish phosphorus to the plants.

(a) Source:—Mostly from the bones of animals directly or in fossil forms.

(b) Places obtained:—Western plains of United States. Plains of Argentina. Slaughter houses of large cities. Greatest amount produced from fossil remains of animal life known as phosphate rock, from which by chemical process, fertilizers are made.

(1) Fossil Phosphates:—Lime phosphate rock found so near surface that it is dug from pits.

Location:—Industry started near Charleston, S. C. Monopoly of trade in this state from 1870 to 1890. Greatest output now near Tampa, Fla., which state produces about four-fifths of output since 1910. Deposits of great extent have also been located in Tennessee, Wyoming and Idaho.

Exportation:—In addition to supplying the American market we export over a million tons a year, chiefly to England, France, and Germany. This export has somewhat fallen off since the beginning of the war.

(2) Acid Phosphate:—Phosphorus becomes available as plant food only after it is dissolved a service that sulphuric acid performs in the factory, making the commercial product, called acid phosphate.

(3) New Source of Phosphorus:—In smelting iron the limestone used in the process and also for the lining of the furnace, draws the phosphorus from the molten iron, this material called basic slag is later ground up, or crushed and sold as a fertilizer.

2. POTASH.

This great raw product holds second place in the fertilizer industry.

Location:—The whole world formerly depended upon the mines of Stassfurt, near the Elbe river in Germany for its supply,

where, in strata overlying an inexhaustible deposit of common salt, is to be found the only collection thus far known of available potash of vast commercial importance. The potash salts at Stassfurt are of many different kinds, for this reason chemical works of the most varied types and greatest number are located in this city, making it the greatest center of chemical manufacture in the world. From Stassfurt go forth materials for the soap maker, the bleacher, the druggist, the glass maker, the dyer, the potter, the photographer, the gunpowder producer and the fertilizer manufacturer.

Before the present war, the United States was a heavy importer from Germany but the paralyzing effects of war upon trade, and the exactions of the German Potash Trust, backed by the German government, caused the United States government to make formal experimental search for this mineral which, with tin, has long been the most conspicuous shortage in our wide distribution and plentiful supply of natural resources.

(a) Result of United States government investigation:—Discovery in 1911 of a deposit of potash in an old bed of a dry California Lake, estimated to contain from five to fifteen million tons. This deposit because of its remoteness from transportation facilities and population has not been utilized. Another source, much more promising, is the potash obtained from Kelp, or sea weed. Several hundred square miles exist off the Pacific coast of the United States.

(b) Value:—Conservative estimates place the output of 100 square miles of this kelp at one million tons of Chloride of potash approximating about forty million dollars worth per year. The permanence of these beds are assured by the fact that they feed upon the exhaustless chemicals of sea water. The manufacture of this potash has begun, and reached some commercial importance in California. But its technique of process is still largely to be developed. This sea bottom product which, like fish, belongs to the catcher, will probably escape the monopolizing influence of a potash trust.

3. NITROGEN.

The third and most expensive of the fertilizing materials is nitrogen. Nitrogen has many and unlimited possibilities of supply. This rather negative element comprises three-fourths of the

air, and in the future we may draw upon this supply as we do upon water.

(a) Source of Supply:—At present the output is from all animal matter, and fertilizing factories receive refuse animal products from butcher-shops, and slaughter houses. Also dried fish, crabs, etc., are important nitrogen fertilizers.

(b) Nitrate of soda, like guano, is the greatest natural nitrogen-supplying material. It accumulates in commercial quantities only in deserts where absence of rainfall prevents its dissolution and removal. A moderate quantity is found in Death Valley, California, in the Great American Desert, and in other arid regions of Nevada and California. The vast nitrate beds in the desert of northern Chile are the principal source of the world's supply of nitrate of soda and gives Chile a monopoly of this product.

(c) Method of Mining:—The process of preparation is simple. It is dredged out of the extinct lake beds like clay and gravel, and taken away in carts to the nitrate works, where it is refined. This process consists in dissolving it in water, then evaporating the water leaving crystals of nitrate. By-product of nitrate of soda is iodine, and Chile, having practically a world supply of both these products, controls the production and price of nitrate and iodine arbitrarily. The possession of this valuable monopoly has profoundly influenced the political, financial, industrial, and commercial development of Chile.

(d) Output:—The Chilean export amounts to about two million tons yearly. Of this amount the United States imports about five hundred thousand tons annually.

(e) Manufactured Nitrate:—Chemistry has invented a new process of manufactured nitrogen that will still leave the market well supplied when the natural product has become exhausted.

(f) Source of Chemical Supply:—Sulphate of ammonia yields as much nitrogen, pound per pound, as does nitrate of soda. It is one of the by-products of coal distillation.

(g) Amount of Production:—The total output approximated one and one-half million tons in 1913. More careful conservation in the use of our coal would enable the United States alone to produce about a million tons of this product.

Scientists estimate that the supply of coal will be exhausted at a not distant date, but the air and waterfalls we shall have with

us always, therefore our ultimate source of nitrogen will be the atmosphere.

(h) Illustration:—Germany imports from Norway something like 15,000 tons of manufactured sodium nitrate and calcium nitrate yearly. This product is obtained from the illimitable atmospheric nitrogen caught in the electric furnace by the electric spark from a hydroelectric current produced by delicate mechanism, and financed by German capital in the defiles of the Norwegian mountains.

(4) Cyanamide,—Another nitrogen supply not unlike nitrate of calcium in analysis and production. After several years' experiment in its manufacture in Norway and France, where water power is cheaper than in the United States, a plant controlled by American capital, has been put in operation at Niagara Falls.

(5) Location of Fertilizer Industry:—The fertilizer center finds its best location upon the sea coast, or upon navigable arms of the sea; so that potash from Germany, nitrogen from Chile, bones from Argentina, and fossil phosphate from Tampa may be unloaded direct from ship to factory. Thus fertilizer plants are located near almost every Atlantic port from Maine to Florida. Georgia is the leading state in fertilizer manufacture.

(6) The Future of Artificial Fertilizers:—The United States is just entering upon an era of great commercial expansion in the production and sale of artificial fertilizers, notwithstanding the disputed theory that is gaining ground in some localities, that soil well aerated, deeply tilled, and sun bathed renews its own fertility without artificial means.

J. Russell Smith says on this subject:

"The comfort of our future depends upon commercial fertilizers more than upon coal or iron. Even the careful Chinese have to abandon otherwise good land where they can get no fertilizer. It is therefore fortunate that we have, even without the aid of the nitrogen gathering bacteria upon plant roots, unlocked indefinite stores of nitrogen and potash. With phosphorus it is otherwise. Phosphorus is probably the point of man's weakest hold upon the earth, and its waste in sewage, the loss of animal excrement, and soil leaching, is a form of resource destruction with which the future must deal, unless perchance we can open some avenue of phosphorus recapture from the great reservoirs of the sea."

To be continued.

American Notes—Editorial

The Editor hopes that some Master-teacher of English will give us a good paper pretty soon about the new style in poetry in these later days. In the days of our youth we looked to the poets to give us inspiration. They took us up upon Parnassus and gave us visions of beauty and glory. They used language that affected us like grand symphonies, or that soothed us like sweet lullabys. Their work reflected the divine order and harmony of the universe.

But now all this seems to be a thing of the past. The poetry that is of today seems to the uninitiated, or shall we say the unprogressive old fogies of yesterday, to have neither music nor meaning. Instead of taking one onto the heights it drags him to the mud flats. It has no rhyme, or at most but little; and only an apology for rhythm. It seeks its themes in the most trivial things, and in very prose, suggests particulars that seem (to the old fogies) to be common and sometimes unclean. We would rather not think of them. They seem at first sight anyway, to be better forgotten than cherished in heart and mind.

Here for instanec are a few lines from one of the modern poets They describe "An Old Man's Winter Night."*

All out of doors, looked darkly in at him
Through the thin frost; almost in separate stars
That gather on the pane in empty rooms.
What kept his eyes from giving back the gaze
Was the lamp, tilted near them in his hand.
What kept him from remembering what it was
That brought him to that creaking room was age.
He stood with barrels round him—at a loss.
And having scared the cellar under him
In clomping there, he scared it once again.
In clomping off; and scared the outer night
Which has its sounds, familiar like the roar
Of trees and crack of branches, common things,
But nothing so like beating on a box.

We might quote also another poem called "Slip Shoe Lovey" by Edgar Lee Masters, which describes (be it said this time with at least the grace of rhyme) a kitchen-maid who is "the cook's understudy" "a gentle idiot body." Here is one stanza of this poem:

"You are hurrying and scurrying
From the sink to the oven,

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* By Robert Frost.

So forgetful and so sloven.
You are bustling and hustling
From the pantry to the door
With your shoe strings on the floor
And your apron strings a-draggin'
And your spattered skirt a-saggin'.

Imagine the youth of tomorrow substituting this for some of the classics upon which we were brought up,—the Iliad for instance, or Hamlet or The Princess or Browning's Poems!

Well, we suppose the defence will say that whatever is, is good and a proper subject of contemplation and study. It is the tendency of the age to analyze and particularize. It is a part of the creed of today that the tiniest particle of God's world is a miracle and as necessary to the whole and as subject to God's laws as the widest sea or the highest mountain. The writer who can see what is really in the common things and who can make others see as he sees probably deserves the name of poet,—*maker*. But it takes time and effort to get the vision adjusted to the new style of verse. Will some of our literature teachers give us their impressions and help us in our strivings to accommodate our failing eyesight to the new revelations of truth and beauty?

The constructive instinct is so fundamentally a part of every individual that it has recently led among men of science to a production of data greater than we are at present able to codify, interpret and disseminate. Education is conservative; we cannot expect immediately the needed shifting of the emphasis now laid upon research work to the equally important work of diffusing this knowledge. Scientists will continue to make a fetish of original investigation for some time to come. Yet we must pause a moment when we consider that there are vast masses of information which never reach the reading public.

Two of the principal sources of such knowledge are the theses of the graduate students in our universities, and the numerous scientific journals in America. These latter are constantly publishing articles which would inform the man on the street and the woman in the home, if they were but shorn of superfluous statistics, clothed in popular language and interpreted to the adult who has NOT had a college education. For example, there is at least one article, I am sure, in every issue of "Pedagogical Seminary," (and certainly *two* in each issue of "Education") full of facts and food for thought, which would throw light on many problems of everyday life, and which set forth vitally interesting facts. Government and Commission Reports are a third source of information

which rarely reaches the average reader. These bulletins are highly accurate and they would, indubitably, correct innumerable erroneous opinions, and such is one of the functions of education.

Many valuable investigations never get beyond the university or government storeroom for the lack of definite attempts to popularize scientific research and thus to make its potential power kinetic energy. Were there some such agency—and University Extension Work is in a small way attempting to supply this need—many a research student would be not only stimulated in his arduous work but also saved the distressing experience of spending several years of his life developing a certain problem only to discover at the last moment that some scholar in another institution has exhausted the same field.

There is a definite need for the formation of a bureau which would undertake three tasks, viz.,

1. The collection of duplicates of every thesis and bulletin dealing with educational, psychological, physiological, biological and similar topics by reputable scholars and students.
2. The publication of abstracts of these, and of cross-indexes.
3. Above all, the establishment of a corps of public lecturers to disseminate these facts in popular form at lectures and addresses before clubs, schools, churches, institutes, conventions, and the like, somewhat after the Chautauqua plan.

In a word, we have now much emphasis on original research but no disseminating agency to put these facts into circulation. To coordinate American research and to diffuse valuable knowledge there is needed a bureau to perform the three functions mentioned above, thus both organizing our bulky production of scientific data and serving as intermediary between the research scholar and the reading public. Might not all this be realized by extending the work of the U. S. Bureau of Education and then, thru its Specialist in Higher Education, co-operating with every American institution along these three lines? Or can we not hope for other suggestions, practicable and constructive, from men engaged in the various fields concerned?

Contributed by John L. Peckham, Pennsylvania State College.

The home and the schoolroom furnish an unsurpassed "university" for the education of "grown ups" as well as for children. The entire unfolding process in its infinite variations is to be seen and studied in the home from childhood to old age, from birth to death. It needs but the observant ear and eye and the thinking mind and one can find in the experiences of the home and the school types of what is, and examples of what is going on in all the world. Here are two or three concrete examples, observed recently by the Editor and pondered over for their educational significance.

Christmas brought to an eight year old lad his first real mechanical toy,—an "Erector Set." A small motor accompanied it and a pair of batteries. What will he do with it? Ah, how that question recurs through life in relation to all our responsibilities! What will a man do with his new business or profession, with his car, with his house, with his child, with his church? They all come to him as new experiences, fresh opportunities! What will he do with them?

The lad in question began by exhausting his batteries in a few hours, just for the fun of "seeing the wheels go round." Then his motor was useless, and the paternal pocketbook was appealed to, to secure a more lasting source of power. A transformer was obtained so as to make available the house current. This was great. One hundred and ten volts were now within reach. What will he do with them? Ah, the old question! This lad used them to make the wheels go round still faster and longer. But alas, he had not yet enthroned reason and moderation. The new force he was manipulating got the better of him and burned out the interior mechanism of his motor and brought everything to an apparently ruinous standstill. It was a trying time for the lad, his father, and the pocketbook, as well as the motor. What should be done? Should they all give it up? Call it a failure? Conclude the lad was too young and not cut out for a mechanic? What will the family do with it,—this experience, this adventure with a new force that is at once so serviceable and so destructive? It was decided to make another effort,—and investment. This time the laddie "went slow" and studied. He learned the nature of the electric current. He found out how to handle it. He discovered the necessary limitations, and now, for a lad of his years, he has a good control of a new instrument of service and amusement. Who knows but what he has found a vocation?

Another incident: A boy built a snow fort in the front yard. He lived "on the hill." Three boys from "the hollow" itched to smash the fortification. Why? Who knows? Why does the laboring man, so-called, hate the capitalist? These boys form a plot. As soon as the builder of the fort has left home for school they (the truants!) appear, stealthily approaching behind the street fences and shielded by an umbrella. The knight of the fort has scented the plot and left his mother on guard in the front of the house. The conspirators prepare a large stock of snow-ball ammunition behind their sheltering umbrella. They draw near. The maternal relative, at the critical moment appears at the front-door. Quietly but firmly she forbids the assault. Shamefacedly the storming party retire behind a tree for consultation. After a time one of them comes out into sight and asks, "cant we just fire *one snowball apiece* at it?" "No, not one! If you do you will be reported to the master," is the firm reply, kindly spoken. Slowly the conspirators withdraw. They are evidently sorely chagrined. They are just aching to smash that fort.

We will leave it to the reader to think out the educational bearings of this incident. It seems to the writer that they lead far into the field of morals, sociology and economics, and suggest questions that are worth thinking about. But it would be too bad to spoil a good incident by "preaching" home its moral, so we forbear comment.

One of the marvels of modern times is the transformation wrought in an incredibly short time by the American Farmer and the American School in the conditions of a given locality in our great West. Here is an incident related by Mr. C. J. Blanchard, Statistician, and published in the "Reclamation Record" by the Department of the Interior at Washington, D. C.

"I quizzed a newcomer from Illinois as to why he left the Middle West for Idaho. He said there were two things which induced him to come—cheaper land and better schools. 'Why,' said he, 'do you know that my boy and girl go to the finest graded school in the United States? There isn't a better school in the world attended by country children than the consolidated school of Burley.' Pretty strong statement, wasn't it? It made me want to look into it, and I did. Putting myself in the hands of Prof. Roe, superintendent of instruction, I discovered that Burley and the country districts by combining forces and capital have produced about the last word in the consolidated school. The movie man, with camera ready, undertook to film the school at close of day, but 1,100 children homeward bound are not to be controlled. Five hundred of them were rushing pell-mell for the long line of school wagons ready to start for the country districts. Think what a picture this was to one who 10 short years ago saw the country a desert."

One of the most generous bequests ever made to a municipal university is the gift of Francis H. Baldwin to the University of Cincinnati. Mr. Baldwin, a merchant of Cincinnati, left the major part of his estate to the City of Cincinnati for the unspecified uses of its university. The bequest is approprimately $675,000. The suggestion has been made that the bequest be converted into an endowment fund, the proceeds to be offered each year to the point of greatest need. It is likely that the next new building, possibly an assembly hall, will bear the name of the donor.

Educators and religious leaders will get together to consider the religious significance of the present world struggle in the convention of the Religious Education Association which meets at Boston, February 27th to March 1st, 1917.

The Fourteenth General Convention of the Religious Education Association takes up the theme "Religious Education and the Coming Social Order." The program is planned to face the question: How should youth be trained and prepared to meet the needs and demands of the great changes that are sure to follow the world war? It is therefore a convention on "preparedness," but not on preparedness by armament but by education. The association is an international organization; it has members in all the warring countries and it is expected that the attendance will represent many nations and lands.

For its real educational and human interest we quote the following excerpts from a Bulletin of the Washington Bureau of Education.

It is with the purpose of more clearly defining the ideals held by those teaching home economics that the Commissioner of Education recently caused a letter to be sent to the teachers in the high schools of the smaller cities and villages asking the reason for the giving of lessons in home economics in their communities. A few of the thoughtful answers that have been received are quoted below in the hope that all the teachers of home economics may be influenced to make their ideal the expression of the highest service they can render.

Concisely stated the purposes in home economics teaching are expressed as follows:

IDAHO—"We endeavor to develop interest in the activities of the home and to make our girls more efficient in the duties of the housekeeper and better able to cope with the problems of life."

INDIANA—"Our purpose in teaching the household arts is to give our girls a sense of the responsibility which they now have in the home and will have in the future, also of their responsibility to their community."

MISSOURI—"I consider the purpose of teaching home economics in the high school to be that of placing the girls who study it in a position to properly adjust themselves to their environment, by having as a sound foundation the principles which underlie the building of the home to-day."

MASSACHUSETTS—"I believe that every girl should be able to plan, cook, and serve a simple meal; to make, alter, and repair simple dresses; to buy all household supplies with judgment; and to carry on with intelligence the ordinary household processes. I think, too, that high school work should be inspirational and that as potential home makers the girls should acquire ideals along with a knowledge of principles which should fit them to take their part in community and national 'housekeeping'."

TEXAS—"We teach home economics to our girls in order to raise their estimate of the value and dignity of home duties; to arouse a scientific interest in the subject; and to establish closer relations between school and home."

Foreign Notes

ENGLAND.—One of the most important of the education committees working on plans for reconstruction in England was appointed to review the teaching of modern languages. The province of the committee is very broad. They are charged to have regard to "the requirements of a liberal education, including an appreciation of the history, literature, and civilization of other countries, and to the interests of commerce and public service." They must, therefore, comprise in their inquiry the work of schools, of universities and of specialized institutions, and they will of necessity depend upon similar investigations that have been ordered by the different classes of schools and the associations particularly interested in this subject. Among these auxiliary bodies is the subcommittee appointed by the Modern Language Association "to investigate the facts and report on the question of university appointments in modern languages." The original reference was subsequently expanded as follows: "To consider the question from the point of view of the relation between schools and universities." This committee has already rendered a report which is comprehensive and precise and full of instruction for teachers and school officers in the United States to whom the problem of modern language teaching has become one of supreme consequence. This report together with an illuminating discussion of the scope of the government committee is comprised in the supplement to the London Journal of Education for December.

The findings of the committee on university appointments centered in the choice and preparation of future teachers of modern languages. This subject is considered in a third article in the supplement referred to by Cloudesley Brereton, a member of the committee and an authority on the subject, of high repute both in England and on the continent.

It is interesting to note that an enormous impulse has been given to the study of continental languages in Great Britain, and that while the importance of French has been increased by the experiences of the war, Spanish, Italian, and Russian now dispute second place with German.

The position of president of the board of education in the reorganized government under Lloyd George has fallen to Dr. H. A. L. Fisher, Vice Chancellor of Sheffield University. This appointment is characterized by the London Times as "a momentous departure from all political precedents." His selection is taken as a sign that the Prime Minister is in earnest about pushing the measures for educational reconstruction that were started under Premier Asquith. Dr. Fisher was one of the original members of the Modern Lan-

guages committee and also of the committee on the civil service, duties which he will probably have to surrender for the larger responsibilities now thrust upon him.

FRANCE.—EDUCATION OF ADULTS.—The system of classes for the continued education of youths and adults started by Jean Macé in 1894 has continued without interruption to the present time. The State contributes an annual appropriation to this work which, beginning with 20,000 francs ($4,000) in 1894-95, reached in 1914, 900,000 francs ($180.000). The municipalities bear the greater part of the expense, appropriations from this source in 1914 amounting to $360,000. The instruction is carried on chiefly by regular teachers of primary schools assisted by professors of secondary education. It takes the form of a lecture or course of lectures, but ample opportunity is given for question and explanation so that the lectures often assume the character of class instruction. The total number of lectures in 1914 was 54,351 employing the services of 60,000 teachers, many of whom were assisting with the stereopticon. The lectures are intended either for young men or young women, or for both sexes according to conditions.

As a consequence of the war, the attendance upon the continuation classes, as they may be called, declined in 1916 to 30,000, over half the attendance in 1913-14. In part this was due to the loss of ten departments which were either occupied for the time by the enemy or were the scene of warfare. At the same time the response of 25,000 male teachers to the call of the army deprived these evening classes of many devoted workers. So far as possible the losses were made good by women teachers. This change greatly increased the number of lectures attended by both sexes, and it was noticeable that the young men showed great respect for the women teachers while the presence of both sexes in no way diminished the interest in the instruction. It appears, therefore, that coeducation has received a new impulse from the necessities of the war. Necessarily the audiences were limited almost entirely to youths excepting in the larger towns where women and refugees eagerly sought to extend their limited education. The programs were adjusted to conditions growing out of the war. For young men they consisted in the review of matters learned in the primary school to which were added practical lessons, commercial, industrial, or agricultural in their character, and illustrative lectures on geography, particularly that of the countries of the allies. The courses of instruction special to young women, related chiefly to domestic subjects, management of the home, expenditure of money, etc. In many towns of France this work assumed the character of re-education for disabled soldiers. In such cases the

instruction assumed an individual character and in several cases amounted to a veritable apprenticeship. In particular is noted the case of soldiers whose right arms had been permanently disabled, but who were taught to write and draw with the left hand.

INTERNATIONAL EXCHANGES.—One of the most interesting educational events in 1916 was the visit of representatives of the French universities to the universities of England in response to a special invitation from the latter. When the invitation was received the question naturally arose, why choose a time for such a visit when the universities are stripped of their students and their entire work disarranged as a consequence of war. The answer to this natural inquiry is found in a report of the visit published in the latest number of the Revue Internationale. The itinerary of the French visitors included the principal university centers of Great Britain. Everywhere the same conditions were encountered: The university youth of Great Britain are all with the army, nevertheless intense interest was excited by the researches and experiments conducted in the university laboratories in the interests of war. The higher institutions have been converted into laboratories of the mechanical sciences and chemistry, and workshops for the manufacture of instruments of precision and implements of warfare. The impression made by this display strengthened the ties between the two countries now united in a common purpose.

The intellectual relations between France and Spain were commemorated by a visit of representatives of the Spanish academies to the Sorbonne in October. Among notable addresses made on this occasion was that by Dr. Altamira on the philosophy of history. In the opinion of this philosopher and statesman one effect of the European war will be the formation of a new moral concept in regard to the true mission of nations in the progress of humanity.

A. T. S.

Book Notices

THE CONTEMPORARY SHORT STORY A PRACTICAL MANUAL. By Harry T. Baker, M. A., Instructor in English in the University of Illinois; formerly Special Reader of fiction manuscripts, International Magazine Company, Publishers of "Good Housekeeping," "Harper's Bazar," etc. 271 pages. D. C. Heath and Co.

Along with the growing popularity of the study of the short-story in colleges and preparatory schools has come a tendency to pay more and more attention to the practice and less and less to the historical theory of writing the plot-bound brief tale. Under such circumstances Mr. Baker's volume concerning the contemporary short-story should find a ready welcome among educators, for it presents in cultured style an organized body of practical instruction in how to write short-stories that will sell. The author emphasizes present conditions in the fiction-market and gives much of his advice from the point of view of an editor. On the other hand, he does not neglect the disciplinary and cultural aspects of short-story writing, for he is evidently a teacher and a scholar as well as a good judge of short-stories. At the close of each chapter stands a group of exercises intended to afford the student opportunity for application of the principles which he has just been learning, while in the Appendix the instructor will find an admirable list of titles of "Representative Short Stories" and a richly suggestive group of test questions by which a story may be judged. The chapters entitled "Common Faults", "Structure", and "Character vs. Plot" seem particularly well adapted for class-room analysis. The chief fault of the book, if readableness is ever a fault is that, it is written in such an easily flowing style and abounds so profusely in contemporary and classical literary allusions that the ordinary student will be likely to glide easily over important points and forget them. To avoid this danger, the table of contents, which is merely a list of the chapter-headings, should be supplemented for pedagogical purposes by a more detailed outline. On the whole, however, this new book is a decided improvement over most of its predecessors in the field because of the fluent completeness of its treatment of the most modern phase of its subject. Everybody who has ever tried to write a short-story (and what school teacher has not?) will be interested and instructed by Mr. Baker's chapters, the last two in the book, on "How Magazines Differ" and "A Magazine office from the inside." R. C. W.

GEOLOGY PHYSICAL AND HISTORICAL. By Herdman Fitzgerald Cleland, Ph. D., Professor of Geology in Williams College, Williamstown, Mass. Price $3.50. American Book Company.

This is a large and comprehensive manual (718 pages) from which

all minor details have been omitted, all fundamental principles being included. The human relation has been recognized and the history of life upon the earth is broadly outlined in accordance with the evolutionists viewpoint.

After an introductory chapter on astronomic or cosmic Geology, Part I deals with Physical Geology and studies such subjects as Weathering, work of the wind, of ground water, stream erosion, glaciers, the ocean and its work, structural features of the earth, earthquakes and volcanoes, metamorphism, mountains and plateaus, historical geology, the various geological periods and their characteristics with a full account of the appearance and development of life upon the earth. The book is admirably illustrated with a large number of carefully drawn and well printed cuts. Altogether, this makes a complete and thoroughly satisfactory college text-book of a fascinating branch of human knowledge.

PRACTICAL ENGLISH FOR HIGH SCHOOLS. By William D. Lewis, A. M., and James Fleming Hosic, Ph. M. American Book Company. Price $1.00.

This is an excellent "working manual," dealing largely with situations which actually arise in the average man's daily experience. The authors frankly state that it is "the outgrowth of the new movement to distinguish between English for work and English for leisure." So we find many helpful suggestions as we turn the pages, on how to write and speak English, grouping ideas, helping the eyes, building a vocabulary, telling a story, making people understand and believe us, visiting by mail, doing business by mail, keeping up with the world. It will be a pleasure to join a class that is working with this book.

SELECT PROSE OF ROBERT SOUTHEY. Edited with an Introduction by Jacob Zeitlin, Ph. D., of the University of Illinois. The Macmillan Company.

This volume is based upon a survey of the entire literary output of this very fecund writer, of whose total output in prose and verse it has been said that not far from two hundred octavo volumes would be needed if it were to be put in book form. The editor of this excellent college edition of Southey has made the interest and permanent value of the selected material, the paramount consideration. The volume presents what is probably the most nearly complete and representative school and college edition of Southey upon the market.

HANDBOOK OF ATHLETIC GAMES FOR PLAYERS, INSTRUCTORS AND SPECTATORS. Comprising Fifteen Major Ball Games, Track and Field Athletics and Rowing Races. By Jessie H. Bancroft and William Dean Pulvermacher, A. B., LL. B. The Macmillan Company. Price $1.50.

Quite in line with the modern recognition of the play instinct and

the provision for its guidance to right and wholesome ends in the public schools, this volume presents in attractive description and illustration the principal athletic games that are or may be practiced in school playgrounds or halls. The volume is suitable for the players, spectators, coaches and instructors. It will show the Principal or teacher who wants to lead his pupils in the playground as well as in the classroom, how to go about it. It will be welcomed by many for its practical guidance and inspiration.

THE TEACHING OF ARITHMETIC. A Manual for Teachers. By Paul Klapper, Ph. D. D. Appleton & Company. Price $1.45.

Dr. Klapper is Associate Professor of Education in the College of the City of New York and is the author of several valuable text-books based on fundamental principles of education as applicable in the elementary grades. We can most heartily recommend the present volume to every teacher of arithmetic and to every practical bookkeeper and accountant because of its clear exposition of the mental processes involved in figure work and the valuable "short-cut" suggestions that will prove great time savers and efficiency promoters. F. H. P.

A VOCATIONAL READER. By Park Pressey, with an Introduction by J. Adam Puffer. Rand McNally & Company. Price $.75.

This book has rightly been called a pioneer in a new field. It presents a realistic view of many different vocations, any one of which may be exactly the one for which any boy or girl in the classes which will use the book for their reading lessons in the grades, is best fitted. The chapters are fresh, concise presentations of essential features of these different vocations. The book represents a happy thought well carried out. It is sure to interest real boys and girls because it deals with real experiences in real life. F. H. P.

SIMPLE ART APPLIED TO HANDWORK. By H. A. Rankin, Art Master, Silver and Bronze Medallist; and F. H. Brown, A. R. C. A., Art Master, Silver and Bronze Medallist. Volume II. E. P. Dutton Company. Price $1.50 net.

In the preface of this richly illustrated volume the authors say that "in the limited time at the disposal of the ordinary elementary school pupil, the applied arts appear * * to be decidedly more desirable than the fine arts, as more directly affecting the actual subsequent life of the pupil." But in the view of these authors "the necessary deftness, skill, adaptability and foresight which the common applied arts require and engender are surely infinitely to be performed for our pupils, touching as they do the real and the concrete, and presenting in an attractive form replicas of the actual problems of life." These quotations indicate the character of this book. The authors have well realized their own ideas and ideals.

FOOD STUDY. A textbook in Home Economics for High Schools. By Mabel Thatcher Wellman, Associate Professor and head of the Department of Home Economics in Indiana University. Little, Brown and Company. Price $1.00 net.

The book named above, published in January, brings the latest word on this very popular and practical subject of Home Economics. The author was a pupil of Mrs. Alice Peloubet Norton, whose work at the University of Chicago and elsewhere is well known. The dedication is to her as one "whose teaching has been the source of inspiration of this book." The author has wisely chosen to present the subject largely by the inductive method. She aids the pupils to find the facts and then leads them through these to formulate the principles in cooking which are worthy of consideration and of wide application. Throughout the volume the pupil is encouraged to think out things for herself and to learn from experience. Yet enough help is given to arouse curiosity and interest, and to stimulate further research. While the book is not at all intended to take the place of the teacher, yet, either in the school or in the home, it would prove a suggestive and helpful guide to any intelligent pupil or housewife who wished to become a better and more skilled housekeeper.

The adaptation of the topics in this book to the school courses in the subject is seen in their order of arrangement. Jelly-making, pickling, preserving, etc. are placed first as the course in home economics usually begins in the autumn when these things are seasonable. The roasting of meats, the baking of bread, etc. are brought into the winter term when these activities involving the production of excessive heat, will not be troublesome. All ordinary housekeeping duties in connection with the selection, buying, preparing, cooking and serving of food are covered in a careful, scientific and practical manner. In the Appendix there are tables showing Food Requirements for adults, average height and weight for men, for women, and for children of different ages, the fuel value of different foods, etc.

We predict that this will become the leading text book on this subject in the high schools, so many of which are putting in courses in Domestic Science. The publishers, Messrs. Little, Brown and Company, have achieved an enviable reputation as one of the leading book houses in this particular line, having already more than a score of thoroughly up-to-date volumes on the science and art of home-making.

F. H. P.

CHANDRA IN INDIA. A Geographical Reader. By Etta Blaisdell McDonald. School Edition. Little, Brown & Co. Price 45 cents.

A charming new volume in a very attractive and useful series for supplementary reading. Child life and many other phases of life in India are portrayed and in a vocabulary that is simple yet progressive, so that these books are to be commended from the standpoint of language as well as geography and history.

SIXTH READER. By Franklin B. Dyer, Superintendent of Schools, Boston, and Mary J. Brady, Primary Supervisor of Schools, St. Louis, with illustrations. Charles E. Merrill Company.

The aim is "to provide for both oral and silent reading, an abundance of matter that is of fine literary quality and at the same time is fresh and well adapted to the pupil's powers of understanding and appreciation." We judge that the book well fulfils this aim.

WOOD, WIRE AND CARDBOARD. By J. G. Adams and C. A. Elliott, with a Foreword by R. Hudson, M. A. E. P. Dutton & Company. Price $1.00 net.

This volume belongs to "Pitman's Handwork Series." It is a most interesting and useful manual that will aid many a child who is counted slow and stupid, to find himself and get started upon a career. It provides teachers with a valuable series of models in which the use of combined materials is introduced. Besides its uses as a textbook in the class room, it is a book that might well be put into the hands of boys to guide them at that impressionable age when they begin to use tools and manifest the constructive instinct. It will direct their energies toward serviceable ends.

CHRISTIAN CERTAINTIES OF BELIEF. THE CHRIST, THE BIBLE, SALVATION, IMMORTALITY. By Julian K. Smyth. The New-Church Press, Inc.

The four sub-titles above are the chapter headings of the four essays which make up this book. The author is a clear thinker and forceful writer. Opinions may differ as to the grounds upon which be bases his arguments, or even as to some parts of the main conclusions. But most modern Christians accept with varying shades of thought and feeling, the author's conclusion that the Christ, the Bible, Salvation and Immortality are the great Christian verities. This is an excellent book to vivify and strengthen one's personal beliefs.

MOUNT VERNON, WASHINGTON'S HOME AND THE NATION'S SHRINE. By Paul Wilstach. Doubleday, Page & Co. Illustrated. Net $2.00. De Luxe Edition Net $10.

It is well that at last a worthy book has been written and worthily published, about the home of "The Father of his country." George Washington himself said, without boastfulness at the time he said it, that "No estate in United America is more pleasantly situated than this." It has remained a source of pride to Americans, the Mecca of tourists, the shrine of the hero-worshipper. This volume is fully illustrated. It is well appointed in every respect. It should find a place in every well appointed library, both public and private.

WHY WAR? By Frederick C. Howe, Ph. D., LL. D., Commissioner of Immigration at the Port of New York. Cloth, 360 pages. Price $1.50 net. Charles Scribner's Sons, N. Y.

This is another of the remarkable and powerfully suggestive books written since the War of 1914 began. There is abundance of history and timely information in it about such subjects as "The War Lords," "Secret Diplomacy," "Surplus Wealth," "Financial Imperialism," "The Flag Follows the Investor," "The Cause of Increasing Armaments," "The Struggle for the Mediterranean," "Gains and Losses of Imperialism," "The Possibility of World Peace," "Democracy and the Road to Peace," etc. As to "Why War", Dr. Howe's fundamental contentions are (1) The doctrine that "the flag should follow the investor." (2) Surplus wealth leading to financial imperialism in the form of overseas investments. (3) War traders are war scare makers, (4) Those responsible for war are not made to bear the cost of war (the cost of war is borne by the poor through indirect taxation and loans), (5) Wars are born of privilege in politics, privilege in finance, privilege in trade, (6) Wars and preparation for wars are economic:—all these and others which he mentions, are the reasons for war. The last three chapters, "The Issue that Confronts Us," "The Possibility of World Peace," and "Democracy and the Road to Peace," are ably written and well worth reading, though many may not agree with the author's line of reasoning.—J. M. G.

WOODWORK FOR SECONDARY SCHOOLS. A text-book for high schools and colleges, prevocational and elementary industrial schools. By Ira Samuel Griffith, Chairman of the Manual Arts Department the University of Missouri. The Manual Arts Press. Price $1.75.

We believe that this is the most elaborate, complete and satisfactory book of its kind that has ever been published. It contains 370 pages and 580 special illustrations. Such subjects as woods, tools and processes, wood-working machines, wood turning, furniture construction, pattern making, etc. are fully set forth. Teachers and students alike will gain information, inspiration, skill and satisfaction by the use of this manual. F. H. P.

ELECTRICAL CONSTRUCTION. An Elementary Course for Vocational Schools. By Walter B. Weber. The Manual Arts Press. Price $1.25.

It is not easy to obtain satisfactory drawings showing electrical construction. This manual is conveniently arranged upon the loose-leaf plan and presents ninety-three problems covering such subjects as magnetism, construction and action of batteries, Ohm's law, wire operations, electric bell and light-circuits, motors and generators, etc. The collection will save busy teachers much time and makes for clearness of comprehension on the part of the students. R. V.

ELEMENTS OF THE THEORY AND PRACTICE OF COOKERY. A text-book of Domestic Science for use in schools. New edition—Revised and Enlarged. By Mary E. Williams, and Katharine Rolston Fisher. The Macmillan Company. Price $1.00.

This is a new and enlarged edition of a book that in its first edition has achieved a distinct success. A goodly number of successful teachers of Household Arts have contributed information and suggestions. The subject matter covers a course of four terms and is appropriate to girls of the sixth, seventh and eighth grades. The order of the lessons is in accordance with the teachings of experience and is natural and convenient. There are suggestions for reading and home work and for correlation with other studies such as history, drawing and the natural sciences. A very clear, comprehensive and practical text-book. R. V.

WORTH WHILE PEOPLE. By F. J. Gould. Harper & Brothers. Price 50 cents.

A valuable supplementary reader, telling tales of achievement and daring that are actually recorded on the pages of history, "from Thermopylae to the Panama Canal." F. H. P.

Delayed acknowledgments of books sent for review in Education, but for which we have been unable to find room.

"LOCKHART'S LIFE OF SCOTT." Abridged and Edited with Introduction and Notes by O. Leon Reid, Principal of the Girls' High School, Louisville, Kentucky. The Macmillan Company. Price $.25.

THE WALTER-BALLARD FRENCH SERIES. "BEGINNER'S FRENCH." By Max Walter, Ph. D., Director of Musterschule (Realgymnasium), Frankfurt Am Main Visiting Professor, Teachers College, Columbia University, 1911 and Anna Woods Ballard, M. A., Diplomee de L'Association Phonetique Internationale Instructor in French at Teachers College, Columbia University. Illustrated. Charles Scribner's Sons. Price $1.00.

"SCHOOL COSTS AND SCHOOL ACCOUNTING." By J. Howard Hutchinson, Ph. D. 151 pages. Teachers College, Columbia University. Price $1.50.

"THE PURITANS IN POWER." A study in the History of the English Church from 1640 to 1660. By G. B. Tatham, M. A., Fellow of Trinity College, Cambridge. Cambridge University Press. Price $2.50.

"ALICE OTTLEY." First Head-Mistress of the Worcester High School for Girls, 1883-1912. Complied by Mary E. James, with an Introduction by the Bishop of Worcester. Candida Rectaque with portraits and illustrations. Longmans, Green & Co. Price $4.00 Net.

ESSAYS IN EXPERIMENTAL LOGIC. By John Dewey. The University of Chicago Press. Cloth 444 pages. Price $1.75.

Examining this volume one will readily see that the author has produced a book of peculiar interest and significance to the circle of teachers who have come to recognize him as one of the ablest thinkers and writers in the country on philosophical subjects. The introduction differs from the ordinary. It is a complete essay in itself. Kant says: "Logic may be considered as two-fold: as Logic of the general (universal) or the particular use of understanding." Aristotle, the founder of the science gave no definition of Logic. Professor Dewey says: "The essential business of logic is henceforth to discuss the relation of thought as such to reality as such. In fine, logic is supposed to grow out of the epistemological inquiry and to lead up to its solution."

In chapter III we find the following: "There is always as antecedent to thought an experience of subject-matter of psychical or social world, or the previously organized intellectual world, whose parts are actively at war with each other—so much so that they threaten to disrupt the situation which accordingly for its own maintenance requires deliberate definition on re-relation of its tensorial parts."

"Data and Meanings" is not a long thesis, but it is so completely filled with logical ideas, that the reader will be completely absorbed in the subject matter all through the chapter. There is not a section in this volume but what is worthy of an elaborate discussion. Chapter XII is a partial review of Mr. James' book, "Pragmatism, A New Name for Some Old Ways of Thinking." Every student of Logic or Psychology should avail himself of the chance to read two or three books in one, by making a study of this special chapter. When we arrive at the last chapter and find it so easily read, we do not wonder that the Author has won so much favor among the educational world.

R. R. G.

EVERY-DAY WORDS AND THEIR USES. A Guide to Correct Diction. By Robert Palfrey Utter, Ph. D. Harper & Brothers. Price $1.25 net.

Explains the meaning and proper use of a thousand or more words and expressions that are frequently misused. A useful, handy volume for school study or office desk.

THE STORY OF THE BATTLE HYMN OF THE REPUBLIC. By Florence Howe Hall, daughter of Julia Ward Howe. Harper & Brothers. Price 50 cents net.

This is the life-story of an immortal hymn. The story recalls the stirring days of the anti-slavery campaign and the Civil War and the publication of this book should make for the growth of a real sentiment of patriotism.

EDUCATION ACCORDING TO SOME MODERN MASTERS. By Charles Franklin Thwing. The Platt & Peck Co. Price $2.00 net.

Dr. Thwing has set before himself in this volume a difficult and a delicate task. He endeavors to interpret the educational opinions of Emerson, Carlyle, Ruskin, Mill, Matthew Arnold, Gladstone, Newman and Goethe. This is done by selecting from the works of these authors and statesmen certain passages containing statements concerning education. The passages selected are for the most part, no doubt, wisely chosen. They seem in each instance to set forth fairly distinctly, certain educational theories and opinions. But the difficulty lies in getting rid of the impression that all such scrappy presentations of another person's thinking might be overthrown by some other passages, written under other circumstances and at other periods of the writer's life. Education is a subject that is ever yet so imperfectly established in its principles that a live, growing thinker would hardly dare trust a future biographer to restate for another generation what his opinions were in the present generation. The book is readable and useful and perhaps will find its greatest value in the stimulation which it will give, by way of suggestion, to the reader's own educational thinking. F. H. P.

PATRIOTS IN THE MAKING, WHAT AMERICA CAN LEARN FROM FRANCE AND GERMANY. By Jonathan French Scott, Ph. D., with an introduction by the Hon. Myron T. Herrick, former Ambassador to France. D. Appleton and Company. Price $1.50 net.

Believers in the national preparedness movement will welcome this book; and extremists for peace would do well to read it. It shows how both Germany and France have learned by experience the necessity of developing, through the schools, "an intelligent, critical patriotism," to take the place of "a blind boastful patriotism founded on ignorance of national conditions." It is shown that our own country would do well to learn this lesson.

SOME PROBLEMS IN CITY SCHOOL ADMINISTRATION. By George D. Strayer, assisted by Frank P. Bachman, Ellwood P. Cubberley, William T. Bawden and Frank J. Kelly. World Book Company. Price $1.50 postpaid.

SCHOOL ORGANIZATION AND ADMINISTRATION. A Concrete Study based on the Salt Lake City School Survey. By Ellwood P. Cubberley. World Book Company.

Two volumes in the well known School Efficiency Series, edited by Professor Paul Hames. They set forth the results of expert surveys and will prove of great suggestiveness and value to those who have to do with the practical administrative affairs of our public schools.

POULTRY KEEPING. An Elementary treatise dealing with the successful management of poultry. By Harry R. Lewis, B. S. J. B. Lippincott Company. Price $2.00 net.

Fully illustrated and covering the whole subject in a scientific and yet entirely practical and understandable way this volume leaves little to be desired either by the individual poultry keeper or by students in argicultural colleges and other schools. There is no problem in any phase of practical poultry raising that is not thoroughly and clearly treated in this book. Its expert advice will be particularly valuable also to the largest poultryman. All in all, every person with five or five thousand chickens should own and read this work.

THE PHYSICAL BASIS OF SOCIETY. By Carl Kelsey, Ph. D., Professor of Sociology, University of Pennsylvania. D. Appleton & Company. $2.00 net.

This book is the outgrowth of the author's work with his classes at the University of Pennsylvania. He has been in the habit of beginning his course in Sociology by sketching the physical background of life and the general idea of evolution as related to man and society. He has found his pupils universally interested in this method and in the present volume extends to the larger general public the opportunity to obtain the same viewpoint of this important subject. The book is scholarly, clear, suggestive and convincing. It makes an ideal text book for college classes.

UNCLE SAM'S OUTDOOR MAGIC, BOBBY CULLEN WITH THE RECLAMATION WORKERS. By Percy Keese Fitzhugh. Illustrated. Harper & Brothers. Price $1.25 net.

This is another vocation-making book,—an entirely modern form of story book or supplementary reader, which ever way you would have it. It is a book to delight the heart of Gifford Pinchot or Theodore Roosevelt or any other "boy" of equal "pep,"—along the line of discovery, development of natural resources and dare-devil adventure. There are few boys (or men) who will not enjoy it, if they find it.

F. H. P.

ANCIENT CIVILIZATION. A textbook for Secondary Schools. By Roscoe Lewis Ashley. The Macmillan Company. Price $1.20 net.

Designed to meet the needs of "those who desire a short history text to the time of Charlemagne" which shall be not merely a chronicle of events but rather a mirror of the progress of mankind. The social relations are emphasized and civilization is seen in the making. This feature will make the book popular with teachers and pupils.

"THE GREAT TEACHERS." By G. Herbert Whyte. The Theosophical Publishing House, Adyar, Madras, India. A comparative study of Buddha, Krishna, Christ, and Mohammed.

A FUNDAMENTAL STUDY IN THE PEDAGOGY OF ARITHMETIC. By Henry Budd Howell, Ph. D. The Macmillan Company. Price $1.25.

Many earnest workers have been investigating the nature and value of arithmetic as a branch of the curriculum and this book makes available to the ordinary teacher the best results of such research.

A COURSE IN CITIZENSHIP. By Ella Lyman Cabot, Fannie Fern Andrews, Fanny E. Coe, Mabel Hill, Mary McSkimmon, with an introduction by William Howard Taft. Houghton, Mifflin Company. Price $1.25.

This book is written in the interests of the promotion of peace and a sense of brotherhood among men. The paragraphs for Grade I on the Home deal with kindness to playmates, animals, etc. and give examples of this virtue in great men. Grade II relates to the school and playground; Grade III to the neighborhood; IV to town and city; V to nation; VI to American Ideals; VII to the United States and the World; VIII to the World Family. The volume is eminently timely.

"PRACTICAL MATHEMATICS FOR TECHNICAL STUDENTS." A complete course for students in technical and trade Schools, evening classes and for engineers, artisans, draughtsmen, architects, builders, surveyors, etc. By Edward L. Bates, Lecturer on Geometry at the L. C. C. School of Building, Brixton, London and Frederick Charlesworth, Whitworth Exhibitioner, Lecturer on Practical Mathematics and Geometry at the South-Western Polytechnic Institute, London. Containing a large number of practical exercises, with answers and 330 illustrations. D. Van Nostrand Company. Price $1.50 net.

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"THE VISION OF PIERS THE PLOWMAN." An English poem of the fourteenth century. Translated into modern prose with an introduction by Kate M. Warren, Lecturer in English Language and Literature at Westfield College, (University of London). Longmans, Green & Company. Price $.90.

HEATH'S MODERN LANGUAGE SERIES. DIE DREI GERECHTEN KAMMACHER VON GOTTFRIED KELLER. Edited with Notes and Vocabulary. By Harry T. Collings, Ph. D., Professor of German, The Pennsylvania State College. D. C. Heath & Co. Price $.35.

TOLD BY THE SANDMAN, STORIES FOR BEDTIME. By Abbie Phillips Walker. Illustrated by Rhoda C. Chase. Harper & Brothers. Price 50 cents net.

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